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Gleanings in Bee Culture

VOL. XXXVIII

MARCH 15, 1910

NO. 6



THE APIARY OF A GLEANINGS READER IN NEW ZEALAND.

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THE A. I. ROOT COMPANY, MEDINA, OHIO, U. S. A.



MAKE A LIVING WITH BEES. . . .

Read ..
these..
Books

A Year's Work in an Out-
Apiary,
Alexander's Writings on
Practical Bee Culture

Are you getting the best possible results from your bees? What does the season's honey crop mean to you? There is money in bees whether you have a few colonies or several hundred. The bees will do their part every time if you do yours.

Two veteran bee-keepers, E. W. Alexander and G. M. Doolittle, have written of the methods by which they made their bees produce results which might seem incredible to the uninitiated. Mr. Alexander's bee-keeping was **extensive**, while Mr. Doolittle's is on a much smaller scale, but **intensive**. Mr. Alexander had as many as eight hundred colonies at a time, while Mr. Doolittle obtained the results he describes from about thirty colonies. Both are practical bee-keepers of wide experience.

In "A Year's Work in an Out-apiary" Mr. Doolittle explains every detail of the work required from the time the bees are taken from their winter quarters until the last drop of nectar is harvested in the fall. It is a detailed account of just what he did to make his bees produce an average of 114½ pounds of honey in a poor season.

ere are some of the Things Mr. Doolittle Talks about:

114½ lbs. of
Comb
Honey
per Colony

- CHAPTER 1. Putting the bees on summer stands.
- " 2. An inspection of the brood-frames.
- " 3. Bloom-time.
- " 4. How to control swarms when running for comb honey.
- " 5. A simple plan for making increase.
- " 6. How to save unnecessary lifting taking off filled supers.
- " 7. Taking off the surplus; what to do with unfinished sections.
- " 8. Progress in the supers.
- " 9. A simple way to put on escapes without lifting
- " 10 and 11. Taking off honey and storing it in the out-yard.
- " 12. Closing words and further suggestions.

Mr. Alexander was one of the largest, if not the largest, bee-keeper in the United States, and what he has told of his methods must necessarily be of interest to large bee-keepers. He kept bees for over forty years, and produced honey by the carload. His writings are practical, and what he has done others may do if they care to follow his teachings. Contents of the Alexander book:

PART 1.—Bee-keeping as a business. What constitutes a fairly good locality. Amount of honey per colony. Profits in bee-keeping. A few things not to do in bee-keeping. Styles of appliances to adopt.

PART 2.—Taking bees from the cellar in the spring. Spring dwindling. Alexander plan for building up weak colonies. Brood-rearing in the spring. Spring feeding. Making increase v. buying colonies. How to dispose of new swarms and control undesirable increase. Transferring bees.

PART 3.—Honey production. Extracting uncapped honey. Producing comb honey. Comb v. extracted honey.

PART 4.—Disposing of the honey crop. Organizing for better prices.

PART 5.—Queens and queen-rearing. Nuclei for rearing queens. Superseding our old queens. The importance of having queens reared from the best stock. Yellow vs. leather-colored Italians. Rearing queens for early increase. Plurality of queens in one hive.

PART 6.—Wintering.

PART 7.—Bee-diseases.

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EDITORIAL

By E. R. ROOT.

PROSPECTS FOR MOUNTAIN-SAGE HONEY UNFAVORABLE.

MR. L. E. MERCER, one of the prominent bee-keepers of Ventura, Cal., referring to the prospects for California sage honey for the year 1910, writes: "The sage is growing very slowly, and every one says no honey this year. Of course it is too early yet to tell to any certainty, but it doesn't look good to me."

One or two other reports have been to the same effect.

THE PREVALENCE OF HONEY-DEW DURING THE YEAR 1910.

THE following letter from Dr. E. F. Phillips, of the Bureau of Entomology, will explain:

Dear Mr. Root:—Since honey-dew was so abundant in many parts of the eastern United States during the past season, it would be well for the bee-keeping industry to know, if possible, what conditions brought this on. I should very much appreciate it if the readers of GLEANINGS who had honey-dew last year would answer the following questions, and in addition give any facts which might help in solving this problem.

Was there any honey-flow from flowers?

Did bees work on honey-dew and flowers at the same time?

What was the average amount of honey-dew per colony?

On what kind of tree or trees were the insects which produced the honey-dew?

Give dates showing the duration of the honey-dew yield.

Was much honey-dew used for winter stores?

Is the mortality of colonies up to the present date greater than usual among your own and neighboring bees?

What information have you as to the extent of territory in which honey-dew was abundant?

Replies may be directed to the Bureau of Entomology, Washington, D. C.

E. F. PHILLIPS,
In Charge of Apiculture.

Washington, D. C., Feb. 19, 1910.

CORRUGATED-PAPER SHIPPING-CASES FOR COMB HONEY.

IN this issue, in his department "Bee-Keeping in the Southwest," Mr. Scholl mentions a lot of honey that was badly damaged in the corrugated-paper shipping-cases, while that in the same shipment in ordinary wooden cases came through with little injury. Mr. J. E. Crane, on the other hand, continues to ship his honey in the paper

cases, and has no fault to find with them, his buyers even paying him more for honey in the paper cases than in wooden ones. If we are not mistaken Mr. Crane encloses each section in a carton before putting it into the case, so that there is an additional cushion, so to speak, besides the regular corrugated partitions that divide each row of sections both ways of the case. In giving reports of the results of shipments sent in paper cases we believe that it should be stated whether cartons are used for each section, and also whether cases are used made like those advocated by Mr. Crane. If breakage occurs, the paper case should not necessarily be blamed unless Mr. Crane's directions have been followed to the letter. We do not know whether cartons were used for the honey referred to by Mr. Scholl, and we are not sure that their use would have resulted in the safe arrival of the honey; but the construction of the case may have had something to do with the breakage. Since Mr. Crane apparently has no breakage, it would be well to make sure that every detail is as recommended by him.

WINTERING OF BEES UP TO THIS DATE.

WE have just looked over quite a number of our colonies at the home yard, wintered on their summer stands in double-walled packed hives. After the severe cold of the winter that has continued for these many days without a flight since the first of December (and our bees have not had a flight yet), we naturally expected to find a good many dead colonies, and the strong ones weak and suffering from dysentery. But we are happily surprised. We never saw bees in better condition than they are this 26th day of February. All colonies, both under sealed covers and absorbing cushions, are in fine order—exceptionally so. Not a single colony thus far has been lost, and in our preliminary examination we picked out all the weak ones, and those that were made up and fed late. All of them, strong and weak, were in excellent condition; and unless we have a very late spring, with warm days alternating with chilly, cold, and snowy days, there will be very little loss worth speaking of.

Reports from Michigan indicate excellent wintering, and a few scattering reports from Wisconsin show the same condition. A few stray reports from Pennsylvania and Indiana indicate a few winter losses.

Our neighbor, Mr. Wilde, some six or seven miles west of us, has lost only three colonies out of one hundred; and while there are some few weak ones he says the rest of the colonies are doing well.

This has been an exceedingly favorable winter for cellar or indoor wintering; that is to say, it has been easy to control the temperature. For that reason we shall expect all inside wintering to show up even better than those wintered outside.

Later.—Since writing the foregoing we have received a number of reports from various sections of the United States. The indications are that the mortality will be very heavy among bees having nothing but honey-dew, wintered in single-walled hives. Honey-dew stores in outdoor colonies well packed in winter cases or double-walled hives, in the more northern sections of the country, do not necessarily seem to be fatal. Indeed, the reports from most of our northern States, where the bees were properly put up outdoors or indoors, are fairly good. Some reports go to indicate that there is good and bad wintering in about latitude 35 to 40 and east of the Mississippi River. Where the colonies were fed sugar syrup and the old honey dew was covered up, there appear to be no great losses. But pure honey-dew in single-walled hives, unless the hives are located pretty well south, seems to have disastrous effects.

THE RELATION OF CLOVER TO SNOW.

The large amount of snow that has fallen all over the northern section of the country, and has stayed on the ground almost throughout the entire winter, will mean a luxuriant and heavy growth of clovers this coming summer. The ground has been thoroughly watered, and the plants have been protected as they have not been before in years.

In this connection it is pleasant to remember that, years ago, when we used to have these old-fashioned winters, such as we had this year, we had "old-fashioned honey-flows;" that is, there was a flow of clover honey every year; but these open winters seem to have an adverse effect upon the clovers, in that there is a great deal more winter-killing than when the winter is more severe and continued, with snow. Taking it all in all, we are exceedingly hopeful of the outlook for the coming summer.

ADULTERATORS BEING BROUGHT TO TIME.

THE Department of Agriculture, Washington, D. C., is bringing some of the adulterators and misbranders of food products and drugs to time. Some of the specific offenses are as follows: Misbranding strawberry extract, adulteration of lemon extract, misbranding drug preparations, adulteration and misbranding of vanilla and lemon extract, selling of rotten peaches, misbranding of liquors, misbranding of maple, adulteration of seedless raisins, misbranding of evaporated apples, misbranding of cheese, of baking-

powder, of pepper, and powdered assafoetida.

May the good work go on! There is a great deal more that Uncle Sam ought to do, could do, and would do, if that prince of pure-food exponents Dr. Harvey W. Wiley, of the Bureau of Chemistry, could have his way. The fact is, he seems to be overruled by his colleagues, who are in the majority.

On the other hand, we have reason to know that there is very little if any misbranding or adulteration of honey. We have traveled over a good portion of this country, and have been keeping, as we believe, in fairly close touch with the great market centers, and we do not hear or know of any adulterated honey of any sort, and we do not believe there is any, a magazine article to the contrary.

PRICE OF HONEY; SOME REASONS WHY IT DOES NOT KEEP PACE WITH THE ADVANCES OF OTHER FOOD PRODUCTS.

THERE is one point that perhaps has not been touched upon by our correspondents in the general discussion that has appeared in our columns during the last two or three issues. Say what we may, the fact is that the price of *all* sugars, syrups, and sweets in general have maintained about the same level for years back. The price of honey is dependent *somewhat* upon the price of other sweets, like maple syrup, granulated sugar, brown sugar, and New Orleans molasses. The facts are, for the last ten years there has been very little fluctuation in the price of these commodities. The probabilities are that, if there had not been a general advance in general food stuffs, the price of sugar and the different grades of molasses would have decreased.* So long as a standard table article like maple molasses, one of the finest products that was ever sold, remains stationary, extracted honey can not go much above its present figures, for the dear public will not pay too high a price for mere flavor, or at least until it is educated to the fact that honey is a predigested sweet, more easily assimilated than the ordinary cane sugars and syrups on the market. We do not mention the different classes of glucose or the so-called corn syrups, as we do not for a moment consider them in our class.

Maple syrup is an article produced only in very limited areas in the United States—one section in Northern Ohio, another in Michigan, and still another in Vermont. There are a few other places where limited quantities are produced; but the three first mentioned produce the great bulk of the maple syrup that is made in this country. This means that the genuine maple syrup, a boiled-down sap of maple trees, has a very limited production. The amount annually turned out is very small in comparison to the annual production of extracted honey alone, to say nothing of that produced in the comb. Yet notwithstanding that, and the further

* Its production has increased faster in proportion than the population.

fact that it is the finest table syrup, outside of honey, that was ever produced, it has been selling for the last twenty years or more at the old regulation price of \$1 00 a gallon, and is still selling at that price. Sometimes it reaches the figure of \$1.25, but this is very rare. The price soon gravitates down to \$1 00 and stays there.

This is more remarkable when we consider the fact that the national pure-food law has practically stopped the selling of all adulterated syrups bearing the name maple syrup. This means that the competition of the adulterated goods has been eliminated except for that syrup bearing the name of "mapleine," which seems to be a legitimate product—a cane syrup flavored from an extract from maple wood. In spite of the limited production of maple syrup, and the fact that it has almost no competitor in the field except honey, it is remarkable that the price hovers around the dollar mark year in and year out, notwithstanding all staple articles of food, outside of sugars, have advanced in price. Unless there should be a marked advance in the price of the general sugars, and that does not seem probable, in view of the vastly increased production, we probably can not expect any very marked increase in the price of ordinary extracted, although there will be some increase, especially among the finer grades of comb honey.

OHIO FOUL-BROOD LEGISLATION.

PROBABLY before this journal is in the hands of the reader an effective State-wide foul-brood bill having the general features of the model law recommended by Dr. E. F. Phillips, of the Bureau of Entomology, will be before the legislature. Senator Paerson will introduce the bill.

Ohio has had for a number of years a foul-brood law, but it is based on what is known as the county plan; and, as we have before explained in these columns, it is a dead letter. The county plan of fighting foul brood has always been a failure except where the counties are very large, as they are in some of the Western States.

This bill has the sanction and support of the Ohio State Bee-keepers' Association; the Southwestern and Hamilton Co. Bee-keepers' Association; Secretary Sandles, of the Ohio State Board of Agriculture; State Entomologist Shaw, of the Department of Agriculture, and all the bee-keepers of the State. This law calls for no appropriation, because the Department of Agriculture will assume the expense if we will only give it police authority to carry its provisions into execution. The following is the text of the bill that is to be introduced within a few days.

AN ACT

To establish a Division of Apiary Inspection in the Ohio Department of Agriculture, and to repeal certain sections herein named.

SECTION 1. The Ohio State Board of Agriculture is hereby authorized to establish a Division of Apiary Inspection in the Ohio Department of Agriculture, and to appoint a competent entomologist as the chief inspector of said division, and the necessary assist-

ants, who shall, under the direction of the board, have charge of the inspection of apiaries as hereinafter provided; he may investigate, or cause to be investigated, apiaries as herein after provided; he may investigate, or cause to be investigated, outbreaks of bee diseases, and cause suitable measures to be taken for their eradication or control.

SEC. 2. The inspector or his assistants shall, when notified in writing by the owner of an apiary, or by any three disinterested tax-payers, examine all reported apiaries, and all others in the same locality not reported, and ascertain whether or not the diseases known as American foul brood or European foul brood, or any other disease which is infectious or contagious in its nature, and injurious to honey-bees in their egg, larval, pupal, or adult stages, exists in such apiaries; and if satisfied of the existence of any such diseases he shall give the owners or care-takers of the diseased apiaries full instructions how to treat such cases as, in the inspector's judgment, seem best.

SEC. 3. The inspector or his assistant shall visit all diseased apiaries a second time, after ten days, and, if need be, burn all colonies of bees that he may find not cured of such disease, and all honey and appliances which would spread disease, without recompense to the owner, lessee, or agent thereof.

SEC. 4. If the owner of an apiary, honey, or appliances, wherein disease exists, shall sell, barter, or give away, or move without the consent of the inspector, any diseased bees (be they queens or workers), colonies, honey, or appliances, or expose other bees to the danger of such disease, said owner shall, on conviction thereof, be fined not less than fifty dollars nor more than one hundred dollars, or imprisoned not less than one month nor more than two months, or both.

SEC. 5. For the enforcement of the provisions of this act the State Inspector of Apiaries or his duly authorized assistants shall have access, ingress, and egress to all apiaries or places where bees are kept; and any person or persons who shall resist, impede, or hinder in any way the inspector of apiaries in the discharge of his duties under the provisions of this act shall, on conviction thereof, be fined not less than fifty dollars nor more than one hundred dollars, or imprisoned not less than one month, nor more than two months, or both.

SEC. 6. After inspecting infected hives or fixtures, or handling diseased bees, the inspector or his assistant shall, before leaving the premises, or proceeding to any other apiary, thoroughly disinfect any portion of his own person and clothing, and any tools or appliances used by him, which have come in contact with infected material, and shall see that any assistant or assistants with him have likewise thoroughly disinfected their persons and clothing and any tools and implements used by them.

SEC. 7. It shall be the duty of any person in the State of Ohio, who is engaged in the rearing of queen-bees for sale, to use honey in the making of candy for use in mailing-cage which has been boiled for at least thirty minutes. Any such person engaged in the rearing of queen-bees shall have his queen-rearing apiary or apiaries inspected at least twice each summer season; and on the discovery of the existence of any disease which is infectious or contagious in its nature, and injurious to bees in their egg, larval, pupal, or adult stages, said person shall at once cease to ship queen-bees from such diseased apiary until the inspector of apiaries shall declare the said apiary free from all disease. Any person engaged in the rearing of queens who violates the provisions of this section, shall, on conviction thereof, be fined not less than one hundred dollars nor more than two hundred dollars.

SEC. 8. The Ohio State Board of Agriculture shall make an annual report to the Governor of the State concerning the operations of the Division of Apiary Inspection, which shall give the number of apiaries inspected, the number of colonies treated and destroyed by the direction of the Chief Inspector, and such other information as may be deemed necessary.

SEC. 9. Sections 5853, 5854, 5855, 5856, 5857, 5858, 5859, 13368, 5860, 5861, 5862, 5863, and 5670 of the General Code of Ohio are hereby repealed.

It is very important that every bee-keeper write his Representative and Senator at once, urging their support. If you do not know who they are, inquire of your postmaster, the editor of your local paper, or of some lawyer. If possible, get a response from both, signifying their support.

STRAY STRAWS

BY DR. C. C. MILLER, MARENGO, ILL.

THE MAN who owns a piece of land does not own the nectar on it. Prof. Cook first made that assertion, and I defy any one to contradict it successfully.

F. GREINER, page 107, tells how to make a Miller feeder so that the bees can entirely empty it. Here's another way: Instead of having it in two compartments, make it in one large compartment (as most of mine are made), the bees going up each side. No matter how crooked the hives stand, the bees can get the last drop.

ALIN CAILLAS, *L'Apiculteur*, 97, thinks the discovery that infinitesimal quantities of radium are found in some honeys, not in all, may have much importance medicinally. Not only may it affect lupus and cancer, but the enfeebled, the neurasthenic, and convalescents may feel its benefits. If manufactured radium has proven valuable, he asks whether it may not be more so when taken in its natural state.

LUTHER HACKLEMAN thinks bees are not the heartless creatures they are supposed to be. He watched a worker carrying out a wounded comrade. She dropped with her burden near the hive; but, instead of leaving it heartlessly to its fate, she first *fed it*, and then flew off, as if saying, "Good by, God bless you!" [If she fed it, did not such feeding prolong the misery of the bee that must necessarily starve to death?—ED.]

ADRIAN GETAZ has my hearty thanks for telling me what crazy work I did in changing from square kilometers to our square miles. That Straw, p. 68, should say that in the German Empire the average is 2 86 colonies to the square mile, ranging from 1 43 to 6 56; and with apiaries three miles apart the average apiary would have 25.74 colonies, and in the most densely occupied regions there would be 59 colonies to the apiary. A smaller hat would now fit me!

COMB HONEY, in this locality, doesn't need the heat and even temperature mentioned for alfalfa, page 135. Sections piled near the furnace stood through the winter of 1908 and through this winter so far without granulation, the temperature ranging from 40 to 80, and the door open a good deal of the time. [Any comb honey kept in a warm place for a time will resist the effect of changing temperature better than comb honey that has not been so treated. White-clover honey is much more proof against candying than alfalfa.—ED.]

MONSIEUR G. MARTINET, chief of the federal establishment of seeds at Lausanne, among the red-clover plants he had under selection noticed two or three kinds that were specially visited by honey-bees. He placed them, with others, under a cage of coarse cloth which contained a hive of bees, excluding bumble bees and other insects. One kind was especially visited by the bees,

and showed a harvest of seed as great as plants of the same kind in another cage containing bumble-bees, and even greater. It is believed that rigorous genealogical selection will perfect and fix the type, thus producing a pure race of red-clover capable of fertilization by honey-bees. This special variety being a great producer, the hope is to increase the yield of clover, and at the same time the yield of honey. Moreover, there is complaint of a general disappearance of bumble-bees; and with this new variety and plenty of hive-bees, red clover will be a reliable crop.

THANKS, Messrs Taylor, Holtermann, and Whitney, for contributions to the territory problem, page 154 and following. Now can't you three or some one else put your heads together and help me out? Here's my fix: I would like to keep bees; can't do it without pasture; am told I have neither legal nor moral right to any, and would like by some honorable and honest means to have both. Two of you only tangle me up worse than ever by flinging questions at me. Bro. Taylor alone considers my need, tells me there is a way to obtain territory for pasture, and says, "There is no other way." Good. That is just the way I'll do, then. So I get "a fee simple" in a tract of land two miles square, which, as he says, I own clear through from heaven above clear down to where I never expect to make a permanent residence, and settle down safe in his assurance that no one can dispossess me of the right to keep bees there without my consent. But soon I am disillusioned, for from the apiaries on all sides come streaming bees of other men that promptly "dispossess" me of the nectar on my land, and I have no redress. And now I see the lawyer's trick. R. L. Taylor, I asked for the right to *pasture*, and, in reply, you tell me I can have the right "to keep bees," a right that I had before, and that every one now has who commands a few feet of land. It seems that bee pasture is free to all, just like that Montana cow-pasture Bro. Taylor tells about, and just like much of the cow-pasture in Illinois when I first came here. But that wasn't the best way for the general good, and so Uncle Sam parceled out the land to individual owners. Now, here's the bee-pasture, exactly parallel to the case of the cow-pasture—free to all, with no sole owners. Why can't Uncle Sam do with the bee-pasture just as he did with the cow-pasture? He would thus make a little out of it for himself, make keeping bees as reliable as keeping cows, and do a good thing for the country in general. [The control of bee-territory is an old mooted question. Notwithstanding it has been ably discussed in our back volumes and in late issues of this journal by able men, it seems no nearer solution than it was twenty years. When lawyers and doctors disagree, who shall decide? Unless there shall be some very good reason, we would prefer to have the discussion drawn to a close for the present, especially as the "last say" is so short. *Requiescat in pace*.—ED.]

SIFTINGS.

BY J. E. CRANE, MIDDLEBURY, VT.

I do not quite like Carey Rees' method, p. 767, Dec. 15, of locating hives; for the more compact we can place them, the less traveling we have to do. Besides, what is gained in having the house in the exact center if one has to carry all the honey to one side when moved away?

On page 730, Dec. 1, I believe Mr. Hand has the better of the argument with Mr. Greiner on the use of full sheets of foundation in sections. We bee keepers know that honey in comb built entirely by the bees is preferable to that built on ordinary thin foundation. We also know that it is much more profitable to use full sheets of foundation; and until dealers and consumers are willing to pay us the difference we shall continue to use the full sheets.

The origin of honey-dew, by D. M. MacDonald, taken from the *British Bee Journal*, page 764, Dec. 15, is of great interest at this time. While it may be true that plants do exude a sweet fluid that bees gather, I believe the great bulk of dew, so called, is an insect product, much inferior to that gathered from the flowers by the bees. The practical question seems to be the best use to make of such sweet. He names various uses, to which I would add that of printer's ink, as I understand a large amount of low-grade honey is used for this purpose. He suggests using it for spring feeding, which is, perhaps, the best suggestion of all, although I can not agree with him that it is as good as the very best grade of honey in the market for turning into bees; yet I know it will answer a very good purpose, for I have used many hundred or thousands of pounds in this way.

I can not agree with Mr. Tricky, of Nevada, page 723, Dec. 1, in what he says regarding the use of plain sections. We have used plain sections for many years without trouble. It may make some difference, however, from the fact that we use cartons on all our sections.

We notice that Mr. Tricky has very pronounced opinions as to the paper case being too weak to stand up with its load in carload shipments. I am not surprised that he should feel this way or that such should be his first impression, for at first I felt the same. For years I thought of this material as being very desirable for a shipping case, but could not make myself believe that a paper case could be made that would stand packing in a car and carry the load of honey safely. Therefore I placed the corrugated partitions at first inside of a wooden case to make it strong enough, and after months of study I made up my mind that paper cases were theoretically strong enough, and so I had some 500 cases made. Yet it was with a good deal of

fear that I shipped my first honey in this way; but after four seasons' trial I have no fault to find with them, and dealers are still paying us more for honey packed in the paper cases than in the wooden ones. [See editorial elsewhere.—ED.]

Automobiles for bee keepers, page 557, are of considerable importance to those running outyards. For instance, we have six outyards that we expect to visit once in six or eight days, and spend a day at each yard. To go to all these yards and back makes a total distance of 90 miles; traveling with a horse at five miles an hour would take 18 hours, but in practice a good deal more than that, for many of the roads are quite hilly. An automobile would travel the whole distance in less than half the time, so that we could take care of another yard, or give those we already have much better care than they now get. We have not yet purchased a car, but have in mind a trucking car called "The Rapid" that will travel 10 to 18 miles an hour, and carry 1500 to 2000 lbs. load. It is used, I believe, more largely in the East for heavy work than any other, and perhaps all others together. It is manufactured by the Rapid Motor Vehicle Co., Pontiac, Mich.

On page 727, Dec. 1, Doolittle tells us how to lay out an apiary, and he says that of late he uses four half-bricks for a foundation under his cleated bottom-board. This is all very well so far as it goes, and it may answer the purpose where the colonies are wintered in a cellar and the bricks changed to a new location every season; but when a hive stands in the same place the year round, half-bricks go into the ground very quickly, letting the hives follow. We have found good-sized stones preferable. Some have recommended cement, and I think this might do in many cases. Last spring, in underpinning some for y hives we used slabs of marble six or eight inches wide by one or two feet long and two or three inches thick.

Placing the hives in hexagonal groups is not a bad idea if they are set far enough apart. I located a yard in this way some thirty years ago, but had the hives only six feet apart, and I lost too many queens. Ten feet apart would probably be all right; but the yard takes rather too much room. I like to have the hives in groups, either six, eight, or ten in a group, and then have each group painted a different color.

Mr. Doolittle wisely objects to hives facing the north—an objection which is well taken unless in well-sheltered places. This reminds me that nothing is said about locating the yard in a sheltered place out of the wind. To my mind, this is the most important point of all, especially when the colonies are wintered out of doors. Never locate a yard of bees where it is necessary to place stones on the covers to keep them from blowing off. Also never locate the hives where the snow drifts badly. We have two yards in such places, but we intend to move them soon.

BEE-KEEPING IN THE SOUTHWEST

By LOUIS SCHOLL, NEW BRAUNFELS, TEX.

Dr. Miller, that old comb with the $\frac{1}{2}$ -inch midrib produced dwarf worker bees, and this means that that particular comb had become unprofitable on account of age. This is my point. You are changing points by trying to get me to space the combs further apart—something which the bees can not do.



Plenty of good rains and lots of cold weather, with the ground covered with snow for a few days this winter, have made the prospects in most parts of Texas the best we have had for many years. It is reported that the prospects are not so favorable in Southwest Texas, where the bulk of the honey is produced.



OLD TEXAS VETERAN.

It was my good pleasure last summer to meet one of the oldest, if not *the* oldest, bee-keepers in Texas—Mr. M. S. Klum, of Jacksboro. He came to Texas in 1869, soon after becoming the possessor of bees, and since that time he has kept from 25 to 90 colonies. It has been interesting to hear Mr. Klum relate some of his early bee-keeping experiences. He told in detail about the beginning of GLEANINGS; how he obtained the first four numbers through a special subscription privilege given by Mr. A. I. Root; and how certain changes were made, first to a monthly and then to a semi-monthly. Through all the years he has been a subscriber to GLEANINGS, and he recently sent all the volumes to me except some of the very earliest, which had been destroyed during a fire, and I have added them to my library. Mr. Klum is one of the charter members of the first Texas bee keepers' association, which was organized in 1877 at McKinney, in Northern Texas, and is the only survivor. While he still has bees and takes a great interest in them, he is not able to give them the care that he formerly did. I honor these aged men to whom we owe so much. They went over the rough trails before us and made our paths smooth.



CORRUGATED-PAPER SHIPPING-CASES.

We regret to say that these paper cases did not prove very successful in a trial shipment which we made a short time ago. Eighteen cases of section honey were sent by express from a point in Western Texas to W. H. Laws, at Dallas. Of the eighteen cases, two were of corrugated paper, while sixteen were regular glass-front wooden cases. The paper cases were properly marked, but the wooden cases were not, for the glass fronts showed the contents. At first thought, one would suppose, after examining the two different kinds, that the corrugated-paper cases would be far ahead

of the old style; but the reverse proved to be the case in this shipment. Of the sixteen old-style cases of sections there were hardly enough broken ones to fill one case; but in the paper cases the sections were not only all broken, but they were smashed, and even the cases themselves were badly crushed. They were in such bad shape that we did not even open them to remove the contents, as all was a total loss. The paper was soaked with honey. An examination of the few broken sections in the other cases showed that most of the combs that did not stand the shipment were not well attached to the wood of the sections.

It is not our intention here to denounce paper shipping-cases; but from the result of this experience we should like to warn others to try only a few of them before investing too deeply. We know that we would regret it if we lost a fine crop of comb honey on account of improper carriers. It is possible that the above is an exceptional case; but it is well to err on the safe side. We also give this experience for the benefit of the advocates of this case so they may be enabled to make further improvements if necessary. [See editorial.—ED.]



THAT CHUNK-HONEY EDITORIAL.

That abstract from Mr. Cady's article and the comments made by the editor, p. 33, would make it appear that we Southerners did not understand the situation regarding bulk comb honey in the North as compared with that in the South. It might be well to explain, however, that we are well aware that the North is not at all ready to take to such honey in any great amount; that the people will have to be educated to it first, and that even the bee-keepers will have to educate themselves in the matter as to the best methods to adopt in its production, its care, and putting up for the market, and, finally, the best ways of marketing. We understand all this, perhaps better than the bee-keepers, and the consumers of the North understand our position. We know that it will take time to introduce such an article in the North—that it can not be put off on the public in a wholesale manner right at the very start, without playing sad havoc in the future sales of the article. This was the entire trouble with Mr. Cady's experiment. Instead of letting a "silver-tongued hustler" put off on the inexperienced public in glorifying terms an article that was new, and that was not understood, it would have been much better to introduce it in a small way at first, letting it find a market of its own slowly, which would finally have reached great proportions, perhaps. If not, then the bee keeper is not out much for the small investment in giving it a fair trial. The case referred to is only one of hundreds that have failed because a new thing was lauded beyond the expectations of the buyer. It teaches us a valuable lesson, however, that we should go slow at first when trying new things.

CONVERSATIONS WITH DOOLITTLE

AT BORODINO, NEW YORK.

DO OUT-APIARIES PAY?

"My bees have increased till I have more than I think it profitable to keep in one place, and I came to have a little talk with you about moving a part of these colonies to a place four miles away, where I think the location fully as good as it is where I am. Do you think such a course would pay me?"

"How many colonies have you now, Mr. Morgan?"

"I have 300; and I thought if I could move 100 of them to the place I spoke of it might be better to do so. I must either do this, be overstocked, or sell a part of my bees. At least that is the way I look at it."

"Well, you should know your location better than any one else. Mr. Alexander kept 700 colonies at one place, and did not think his locality overstocked. There are possibly some few localities where 500 to 700 colonies could be kept with a profit, and there are others where 100 colonies would be too many to make a success. For myself, I should consider from 100 to 200 colonies as many as it would be profitable to keep in the average apiary; and if I wanted to keep more I would rather start an out-apiary than to sell all the bees I had above that number."

"That is just what I had hoped you would tell me. Now, how many colonies would you use for an out-apiary?"

"Fifty colonies would make a good start until you could be sure that more would do as well. But this would depend somewhat on how near your own or other bees the apiary was to be established. Of course, if you could go seven or eight miles from any other bees, the out-apiary should do as well as your home yard provided the pasturage were the same. But as a rule I should think 100 colonies would be as many as would be profitable, especially if the out apiary is located within four miles of the home yard."

"Then, according to what you say, I could divide the 100 which I do not think best to keep at home, and start two out apiaries; and if I found that each yard of 50 did well, increase them to 100 later on."

"That would be my way of doing it."

"Then that is what I will do, as there is a place four miles in a direction opposite my home, which, so far as I know, is as good as the other. But don't you think I had better have some one to look after swarms during the summer months?"

"If you are to increase your bees by natural swarming, this will be necessary; but if you work them as given in 'A Year's Work in an Out-apiary' you should not have swarms enough to pay for the keep of any one. I have not had anybody to look after the bees in the out-apiary for more than ten years; and, so far as I know, only two swarms have gone off in all that time. One colony became strong in apple bloom before I put on the up-

per hives, then swarmed; and the swarm got away, as the queen in this case was unclipped, and there was no one to give it a home. Then I had another case where a colony had swarmed several times before I was ready to shake for the first time; and after shaking they built queen-cells and swarmed, without trying for any worker brood. This they kept up, evidently, till I went for the second or final shaking for the year, when they swarmed while I was there, thus telling their secret. However, this was evidently a case of supercedure, as the queen did not lay to the amount of two frames of brood at erward."

"But if I stop all swarming, how shall I increase?"

"When you get home, turn to Chap. V. in the out-apiary book, and that will tell you how you can make all the colonies you may desire, and that, too, with little or no cost to you in honey."

"Then, should I wish to continue out-apiaries still further than the two, I could make all the colonies I wish by what is given in Chap. V., and not depend on natural swarming at all."

"Certainly. The day of natural swarming for increase has gone by, so to speak; for if I am right, few of our most practical apiarists allow little if any swarming, whether at home or in the out-apiary."

"Well, should I conclude in the future to run several out-apiaries how would you locate them?"

"The amount of pasturage should be the first thing to consult. Next is the most convenient way to reach these out-apiaries. If you are to use horses or the automobile as a means of conveyance I would locate an apiary from five to seven miles from my home, as near the four points of the compass as possible, if the location would permit of my doing this; and a fifth one in some good location five miles away from any of these four. I would have five out-apiaries if I could possibly do the work, and in this way I could attend to an apiary each working day of the week, including the one at home."

"When the home yard is located near a trolley line it would be the greatest of fun to locate apiaries at the best locations along this line, for in this way they could be reached at any half-hour. How much should I pay as rent for the ground?"

"There can be no set price for this. In one case I knew of, the man having a fruit-farm, he welcomed the bees without making any charge, considering that he was indebted to the apiarist for the good the bees did as fertilizers of the blossoms of his orchards. Most men, however, want from \$5.00 to \$10.00 a year. And now may I let you into a little secret? Whatever the price agreed upon, when the end of each honey season arrives, make the person whose land you occupy a present of from twenty to thirty pounds of nice honey; and if your experience proves like that of mine you will have a fast friend for all time, with no complaint of the bees being a nuisance, even should they be somewhat troublesome at times."

GENERAL CORRESPONDENCE

THE SOURCE OF HONEY-DEW.

D. M. Macdonald's Opinions Disputed.

BY DR. C. GORDON HEWITT,
Dominion Entomologist.

[This article by Dr. Hewitt, and the one which follows it, by Dr. E. F. Phillips, were received by us at practically the same time. Both writers agree very well in regard to the source of honey-dew, and, coming from such authorities, we feel quite sure that these opinions, together with that from Prof. H. A. Surface, may be taken as the final answer to the question, viz., that most of our honey-dew is an excretion from the aphides.—ED.]

I have read with interest the recent communications in GLEANINGS on the above subject which appears to have been stimulated by the remarks of Prof. H. A. Surface in your issue of October 15, p. 623. In your issue of December 15, p. 763, an article by Mr. D. M. McDonald, in the *British Bee Journal*, was published which tended to disprove the views of Prof. Surface; and in the last issue of your journal which I have just received, Feb. 1, p. 89, Mr. J. L. Byer expresses the pleasure that he will feel should Mr. Macdonald's view be established—namely, that honey-dew is not an excretion.

It is a matter of regret that there should be any doubt in the minds of your readers as to the nature and source of the honey dew in aphides, as this has been established as a scientific fact for many years; and it is on this account, and in order to set the matter at rest in the minds of those who may not have the advantage of being acquainted with the scientific literature on the subject, that I am taking this opportunity of placing the true facts before your readers.

Some writers have believed that the sugary matter called "honey-dew" was produced (I will refer to the use of the two terms "secreted" and "excreted" later) by the pair of peculiar tubes or siphons which exist in certain sub-families of the aphides; but it has been proved by many authorities that this view is erroneous. It has been shown that honey-dew is a product of the alimentary or digestive tract, and escapes by way of the anus, or vent. Certain species of aphides produce large quantities of honey-dew which is so prized by ants and certain other insects, including bees.

In the early half of the 18th century the famous entomologist Réaumur expressed the view that honey-dew does not issue from the siphons but from the anus; and, later, Kaltenbach supported the idea. Forel states definitely that the siphons do not secrete a sweet fluid but a gluey wax which is not sought by the ants; the sugary matter which they lick up is rather an excretory product of the digestive tract.

In 1891 Busgen observed a single individual produce 48 drops, each drop being about 1 mm. (i. e., $\frac{1}{25}$ of an inch) in diameter in 24

hours (p. 193, *Biologisches Centralblatt*, vol. 9). The production of this honey dew is also affected by the temperature; and Brandes (Die Blattlaus und der Honigbau, in *Zeitschr. für Naturwiss.*, vol. 66, pp. 98—103, 1894) found that the greatest activity was in the middle of the day. The fact of the effect of temperature on the production of honey-dew by the aphides is taken advantage of by certain species of ants which keep the aphides warm by erecting small tents or shelters over them which may be compared to cow-sheds.

In the article of Mr. Macdonald's, to which reference has been made, he says, p. 764, "It, like the honey-bee, has something in the nature of a honey-sac, quite separate from its ordinary stomach, and from which, when the sac gets overcharged, it regurgitates or rejects aphidian honey by means of two tubes used for *no other purpose*." Although the author of that statement may be an excellent bee-keeper he is not a scientific entomologist, or he would never have made such a statement, which is absolutely inaccurate. The honey-sac of the bee is the fore-stomach, and is part of the digestive tract. The digestive tract of the aphid has no connection with the two tubes or siphons by which it has been wrongly thought the honey-dew is produced. The gluey waxlike substance which appears in drops at the end of these tubes is secreted by a group of small gland cells situated at their bases. Certain aphides, such as the woolly aphis, chermes, etc., do not possess these siphons or tubes, but have, instead, simple pores on the upper side of the body which produce waxlike threads from wax-glands. If Mr. Macdonald will consult a paper by A. J. Grove, on "The Anatomy of *Siphonophora rosarum*, Walker, Part 1, the Apterous Viviparous State," in *Parasitology*, Vol. II., pp. 1—28, 1909, he will find two excellent figures of the alimentary or digestive canal of this rose aphid on page 7, from which he will see that it is a very simple structure.

Honey-dew is an excretory product of the digestive tract of the aphid which is naturally expelled by the usual aperture. It is elaborated in the digestive processes from the very large amount of sap which the aphids suck up by means of their proboscides; and as it can not be made use of by the insects in building up the body tissues and producing young, it is excreted in a changed form as a waste product. I entirely fail to understand why the idea of its being an excretion instead of a secretion should be repellant to any one; it is merely changed cell sap, as also is honey, both of which undergo a change in the digestive tract of the insect. The difference between an excretion and a secretion is really not so great as at first sight appears. The cells of an animal's body produce certain chemical substances according to their nature. The cells of the salivary glands produce by their activity a secretion known as the saliva; the wax-cells of the aphid and of the bee produce a wax secretion. Many of the cells of

the body extract waste substances from such of the body fluids as the blood, etc., and in turn excrete these substances into the digestive tract or the kidneys, or even, in the case of sweat-glands, on the skin of the animal. Both secretions and excretions may be the results of cell activity. Of course, the term excretion is frequently used to indicate waste products which have never gone through the cells but have passed through the alimentary canal in an unaffected state; that is not, however, cellular excretion.

I may add that, by observation, dissection, and microscopical examination these facts concerning the origin of honey-dew and the nature of the siphons or holes which were supposed to secrete the same have been confirmed by me.

Ottawa, Canada.

THE SOURCE OF HONEY-DEW.

Most of It is in the Nature of an Excretion.

BY DR. E. F. PHILLIPS,

In charge of Apiculture, Bureau of Entomology, Washington, D. C.

The article on p. 763, Dec. 15, by the distinguished Scotch bee-keeper D. M. Macdonald, seems to call for further discussion of this subject. The past season has been a most remarkable one in bee-keeping on account of the excessive amount of honey-dew gathered by the bees, and equally remarkable by the scarcity of honey. The result is that most bee-keepers have on hand a quantity of honey-dew honey. Under such circumstances it is but natural that we should desire to have as good an opinion of the product as possible, for we want to eat it, and we desire also to be able to sell it under a good name. There are a few bee-keepers, however, who do not want the exact truth about the matter, even if it is not what their wishes might dictate.

Honey-dew is a general term, including sweet substances from several sources. There are many plants which have nectaries outside the flower which secrete honey-dew, which is gathered by bees. Among these may be mentioned the hau, of Hawaii (see Bulletin 75, Part V. of the Bureau of Entomology); cotton, some of the acacias, and conifers. It is a mistake, however, to assume, as Mr. Macdonald does, that this is a characteristic of the majority of plants from which honey dew is gathered, for the greater proportion of honey-dew is not a plant secretion but an insect product.

Insect honey-dew is produced by various hemiptera, among which may be mentioned scale insects, aphids, and leaf-hoppers. The production of enormous quantities of honey-dew by a leaf-hopper in Hawaii is discussed in the bulletin referred to above. The insect honey-dew with which we have had to contend during the past season is derived from scale insects and aphids, and only observation can decide whether this is an excretion or a secretion from certain glands.

First of all, it can be stated that Mr. Mac-

donald is mistaken when he states that the plants secrete a sweet liquid on which the aphids come to feed. These insects, and scale insects also, feed only from the inside of the plant through sucking mouth parts. It is not necessary to offer proof on this point so well known to all entomologists. The only question to be considered is whether the sweet substance given off by these insects is an excretion from the anus, or whether it comes from certain glands through nectaries. The popular belief has long been that it is derived from the nectaries, and popular science furnishes beautiful tales of the "milking" of aphids by ants. Such writings are not always infallible.

Probably a large proportion of the honey-dew gathered by the bees this past season was derived from scale insects *which have no nectaries*. The honey-dew from this source is a pure excretion.

That the honey-dew of aphids is an excretion and not a secretion can readily be proven by any one interested enough to spend a few hours watching a group of these interesting insects. Drops of honey-dew will be seen to appear at the anal end of the insects, and then to drop as if forced from the body. This fact was noted as far back as 1800, and since that time has been observed and recorded by various entomologists. Another interesting test will be to secure one of the insects, holding it by the head between the thumb and finger and gently pinching it. Usually, if the insect is well fed a drop of clear sticky honey-dew will be forced out from the body at the anal opening; and if pinched hard the body juices will be forced out here, and also out through the nectaries.

Some groups among these insects will be with long prominent nectaries, and others will be found without nectaries or nectary pores.

The first group *secretes* or *excretes* from the nectaries a very small amount of a white liquid which is by many supposed to be the honey-dew of aphids. Even if honey-dew comes from the nectaries it is an excretion, or the casting-off of the waste products of metabolism for the liquid so ejected is not of use to the animal in any of its functions. Prof. C. P. Gillette, Canadian Entomologist for 1907, p. 236, states that "Neither he nor his helpers who have been observing the *Aphidæ* rather carefully for a few years past have ever found honey-dew issuing from the cornicles."

Among the second group (having no nectaries or nectary pores) some species live in galls formed on leaves; and often a gall, when fully developed, will be half filled with this excretion, and the aphids are probably saved from drowning only by the waxy secretion which is secreted by glands along the dorsal surface of the body. The fact that the species of this group do not have nectaries or even nectary pores, and yet excrete a large amount of honey-dew, is clear evidence that among them the honey-dew is excreted through the anal opening.

As the aphids usually feed on the under

side of the leaves, and when present in numbers excrete a large amount of honey-dew, naturally the honey-dew falls on to the leaves lower down, which are soon covered with a sticky substance.

All observations up to the present time indicate that the honey-dew of aphids is an *excretion* passed through the digestive organs of the body, and is a residue of the juices sucked from the various food plants for the purpose of food.

That smut grows on honey-dew can not be contradicted, and possibly Mr. Macdonald is correct in attributing the dark color of honey-dew honey to such a cause. He is not correct, however, in his assertions that honey-dew is largely a plant secretion and in part a secretion from the nectaries of aphids.

FEEDING POLLEN SUBSTITUTES IN EARLY SPRING.

Is it Desirable? an Interesting Series of Experiments.

BY SAMUEL SIMMINS.

This subject was brought forward in GLEANINGS during 1909, and some of those who have found an occasional deficiency of natural pollen in the early season gave their experiences in supplying substitutes. Over a course of many years I have given this subject much thought and careful experiment. A common practice in Great Britain is that of dusting pea flour on to pine shavings placed in a box, or in an inverted hive arranged in some sheltered sunny corner as soon as springlike weather is in evidence, when a merry hum and happy industry gladden the heart of the enthusiastic if not too observant bee-keeper.

Very few owners have so far realized that this practice is fraught with danger, especially when, during many days in succession, the bees are able to work at this artificial food. They dwindle rapidly because of this unnecessary and ceaseless labor, just at the time their strength should be conserved to the utmost. The process entails excessive water-carrying at the same time, and unusual excitement generally; hence for my own part I am obliged to condemn this apparently innocent method of supplying that which really is not needed at all by many of the colonies in apiaries where the process is adopted.

The pea flour alluded to is very finely ground and cooked, and is known here as syring oris, an article prepared for thickening soups, and of all substitutes is that most sought after by the bees until natural pollen is available.

USED IN THE FORM OF PASTE.

I have mixed it with honey as a stiff paste, and then pressed it into the cells, filling about one-fourth of one side of a comb, and placing that side next the outer patch of brood, if any, or within the margin of the cluster if no brood may be started. A brood-nest would

be then developed; but under no possible circumstances will the bees extend the brood area to such dimensions as they do under the genial stimulus of a natural incoming of the pollen of flowers; and this is just where they do not appear to recuperate sufficiently for the trouble and waste of energy incurred. I may suggest that, if mixed with sugar syrup, the paste becomes so hard as to be quite useless.

DUSTING FLOUR INTO THE CILLS.

Another method I have many times adopted has been that of shaking the dry flour into the cells from a tin box or can having a number of $\frac{1}{8}$ -inch holes punched through the lid. A somewhat cleaner plan I have also used has been that of placing about half a pint at a time in a warm dummy feeder having a receptacle that holds only that quantity, and really constructed as a syrup feeder.

THE WARM DUMMY FEEDER.

By the way, these small dummy feeders, fitting close at each end to the hive sides, and of the depth of the frames, can be used in cool weather, if necessary; and I may say they are the only kind I have found to overcome the objection bees have to taking syrup from feeders when somewhat cold in the early season. You see, this narrow dummy, being placed close to the cluster, the food always remains at nearly the same temperature as the bee-nest, and is readily appropriate. For the same reason, when filled with artificial pollen the workers crowd into the pollen; and this compact working cluster, with the temperature raised in consequence, is an additional stimulus to collection of the nitrogenous food. While the bee working in the open appears compelled to take wing while padding the pollen in place on its legs, the process is not thus carried out in the dark while the bees remain in the feeder, and the food is carried to the cells forthwith; though in some cases I believe it possible the workers prepare the bee-pap straight from the feeder.

One can, therefore, see how it is possible, for early stimulation, to place one of these warm dummy feeders on each side of the cluster—one with several weeks' supply of pollen, and the other for a periodical fillip of syrup. In this case the spring-fed syrup is used thinner than autumn feed, so the bees are not compelled to carry water. The process may be valuable in some climates, and probably often to the queen-rearer, but it is no use looking at these apparently helpful matters without fully considering

THE OTHER SIDE OF THE QUESTION.

Like many other queen-rearers I always have a lot of nuclei to unite in autumn, and the colonies thus established seldom have much stored pollen for early spring use. It is well known that colonies wintered with pollen-stored combs usually breed just a little nearly all the time from the new year onward, in those localities where the weather is not unusually cold, though it may be but one little patch at the heart of the cluster,

and hence this condition is supposed to give such bees a great advantage by the time free flights occur.

The bee-keeper finding his colonies absolutely without pollen (though I believe this is a rare occurrence with permanent colonies properly managed) begins to turn things over in his mind, and thinks his bees will be all backward if he does not supply the deficiency. I have done this many a time, and yet often have I declared I would never do it again. But the advent of a backward season, and no natural pollen available, together, perhaps, with a personally restless experimental turn of mind, I have "gone and done it again," hoping that possibly some new adaptation might at last bring the desired result.

In the first place, I would say that a pollen substitute placed in the cells, either dry or in the form of paste, is not all used by the bees, though a great deal is shifted and packed in other cells like natural pollen. When the latter comes in freely there is found the remnant of the stale stuff which the bees do not seem willing to clear out until the genuine honey business is in full swing, and then they have to pare the cells down to the midrib before it can be disposed of. There is also considerable waste of the same material corroding the floor, but that is not the end of the subject. It should be understood that, no matter how fine may be the meal given by the owner, whether it be sieved or "dressed" free from all shucks, the bees appear to select only the cream, and a great deal of dross is to be noticed after they have worked it over.

But the real question at issue is whether the substitute is wanted or not. Certainly the bees can not breed without pollen; but if you do not give it to them they will sit still; and bees that are quiet are not ageing or dwindling to any extent, though at the back of my mind I will confess there is some idea that bees wintered absolutely without pollen have not the same stamina as those that have it; for bees certainly consume nitrogenous food in cold weather, if they have it, while they may not be rearing brood.

While the substitute starts them to breeding when fed in early spring, I have always noticed it has not been to the same extent that the natural supply will do, and this is probably why this artificial feeding seems to reduce their vitality ultimately, there not being sufficient compensation for the wear and tear induced.

Certainly I prefer stocks wintered with natural pollen; but when in future I have to carry any through without it I have decided not to give them any substitute, though doubtless I shall shift pollen-stored combs around in due season if any are available.

WHITE OF EGG AS A SUBSTITUTE.

Some of your German readers may remember that, many years ago, one of their countrymen claimed to have carried out some very successful experiments (in Germany) by feeding the white of eggs while building up his stocks. I am sorry I have mislaid the paper referring to this matter, so that I can not

now give the exact method. It was probably beaten or whisked into a froth, and mixed with honey. I should imagine sugar syrup would be unsuitable, as the mixture would tend to harden.

EXCHANGING COMBS.

So many bee-keepers worry over pollen-clogged combs that, if it were not for the danger from foul brood, a good business might be done in exchanging pollenless for such overcharged combs. The latter would be invaluable to the apiarist who has no pollen in the early season; and if he had to buy such combs they would be cheap at a dollar apiece if in good condition.

Heathfield, Eng., Jan. 24.

[Mr. Simmins in times past has done a large amount of experimental work, and in the matter of giving artificial pollen it would seem as if he had gone over the whole ground. His conclusions, reached from a different set of experiments, are practically the same as those arrived at by A. I. Root many years ago, and, we may say, by all others who have tried giving artificial pollen. In this connection the reader will be interested in our reply to F. Dundass Todd on page 123 of Feb. 15th issue.—ED.]

HISTORY OF THE INTRODUCTION OF THE HONEY-BEE INTO THE HAWAIIAN ISLANDS.

BY ALBERT WATERHOUSE,
of the Garden Island Honey Company.

[This is the beginning of a series of articles we have in hand on Hawaiian bee-keeping, furnished by prominent writers at the solicitation of the Hawaiian Agricultural Experiment Station.—ED.]

About the time gold was discovered in California a society was organized in Hawaii known as the Royal Hawaiian Agricultural Society. At a meeting of this society held in Honolulu on the 14th of August, 1851, the following resolution was passed: "Resolved, That a committee be appointed to procure the honey-bee from Australia, Central America, or Chile, who are authorized to incur the necessary expense. R. C. Janion, chairman, Baron de Thierry, J. Montgomery, were appointed."

As California was still only a mining camp, no bees were to be found there, and the first efforts of the committee were to secure colonies from New Zealand. At the annual meeting of the society in June, 1852, the committee reported a promise of three colonies from New Zealand. I quote the following tribute to the honey bee from the committee's report, written by Baron de Thierry:

The bee, from sipping the sweets of the flowers, takes nothing from their beauty; and if we should benefit the neighbor who has bees whilst we have none, we know that, even in so small a degree, we are contributing to the welfare of our fellow-creatures. The cultivation of flowers promotes domestic happiness, soothes the mind, and richly repays for the trouble bestowed upon them. The wealthiest, accustomed to the glare and glitter of state, are prouder of a fine nosegay than of their massive plate and costly silks; and the mightiest of queens would scarce appear in festive attire without a bouquet in her hand or a rose in her bosom, emblematic of the purity of her mind and homage to the exquisite works of a greater Being above.

But whilst the palace and the cottage, the dwelling of the richest and the poorest, are so eminently improved by these most attractive of nature's vegetable works, the indefatigable bee collects tribute from every flower, and hordes its treasure with equal fidelity for the cotter as for the magnate, adding to the comfort and profit of both by its unceasing industry. The little stranger, perhaps at this moment on her way, will be the means of visiting upon you an important and inexpensive article of export; and in return for such service, and for the additional comfort which families will derive from that healthful article of diet, and the wax which she so abundantly produces, I trust that some exertions will be made to raise flowers for her support.

Although the promise of bees from New Zealand was made, it was never fulfilled. The same year, 1851, the first actual attempt to bring the honey bee to Hawaii was made. A colony was forwarded by sailing vessel from Boston. The details are given in the following report by C. R. Bishop, read at the June meeting of the Royal Hawaiian Agricultural Society in Honolulu, May 26, 1854.

W. CHAMBERLAIN, *Chairman of the Committee on the Honey-bee*

Dear Sir:—Being one of your committee, and having had within the last year a little experience with the unfortunate colony of these interesting insects upon which you are expected to report, I will give you what information I can relating thereto. I believe that each year since the formation of the Royal Hawaiian Agricultural Society, except the present, there has been offered a premium for the introduction of the honey-bee into these islands. The only persons that I know of who have really been at any expense and trouble to accomplish so desirable an object are Henry A. Pierce, Esq., of Boston, a life member of the society from its foundation, and contributor to its objects in various ways, and Capt. Stearns of the bark Matanzas. In 1851 Mr. Pierce put on board the ship R. B. Forbes one swarm of bees and offered the mate a liberal reward if he would take care of and deliver any of them safely. The hot weather in the South Atlantic melted the honey and drowned all the bees in the hive. In February, 1853, he procured another one swarm, well stocked with honey, and was at a large expense, some \$140, in having it secured on the deck of the bark Matanzas in such a manner that seemed to insure its safe arrival here. The hive was placed in a strong box, leaving a space of six inches all around for air between the hive and the box; then a packing of ice two feet thick above, below, and on each side; outside of which was a space of six inches filled with charcoal, and all enclosed in a case 8 feet square having two lead pipes 3 inches in diameter running from the outside to the hive to supply the bees with air. Capt. Stearns also purchased a swarm and placed the hive inside a box having wire cloth nailed across openings in the sides, and hung at the end of the boat just forward of the cabin. The bark had a long passage, 150 days, and, being becalmed a number of days in the vicinity of the equator in the Atlantic, a part of the ice melted, and during the rough weather off Cape Horn thumped against the decks so heavily as to jar many of the bees down into the water. After they doubled the Cape, Capt. Stearns had them taken out of the large case and hung up under the boat with the other swarm, where they both appeared to be doing well until they arrived within about ten days of this port, when moths made their appearance in the boxes, and the bees commenced to die rapidly, Capt. Stearns' more than the other. When the bark arrived off Honolulu in August, 1852, I went on board, examined Capt. Stearns' hive, and found large numbers of moths, worms, larvæ, and some dead bees inside, but no live bees. The other hive was in very bad condition, containing swarms of moths, worms, and larvæ among the honey-comb. A few bees were living, and they had plenty of honey, some 15 to 20 pounds, a part of which, in the chamber of the hive, was very handsome. I took the hive to my garden, where, with the kind assistance of Capt. Stearns and others, we removed as many as possible of the moths and cleared the hive of worms, dirt, etc., as well as we could, and afterward removed nearly all the honey. There appeared to be from 40 to 60 bees living, among them the queen. The hive of bees and honey was put up and sold at auction in order to give persons understanding the management of bees, or wishing to have them, an opportunity to purchase. I purchased them, had a new hive made, and tried to induce them to occupy it, without success. After a few

days I thought they seemed to be less active than usual, and upon examination found but three or four bees remaining, and, a day or two after, none at all. As there were no dead bees in the hive or on the boards underneath, and no birds about to destroy them, I concluded that they had found some place more to their fancy than the hive, and that I should again see them or hear of them; but I have not, and am unable to account for their disappearance or fate. Capt. Stearns took excellent care of the bees; and had he had a short passage, or even a passage of from 130 to 140 days, would have delivered both swarms in good order which prove that they can be brought from the United States via Cape Horn without any great expense or trouble except to have them secure against any excessive heat and rough handling; but great care should be taken in the beginning to select hives free from moths and their eggs. Had the swarm mentioned arrived here in better condition it probably would have been better to send it immediately to a cool locality on Maui or Kauai in the vicinity of sugar-plantations and banana-fields; but it was too far gone to admit of any delay in removing the destructive enemies of the bees.

We have a great variety of moths and ants in the islands, from which it would require constant care to protect the bees. I have lately learned that honey-bees have been recently introduced into California. By and by we shall probably be able to get them from there more easily than from any other place. The thanks of the society are due to Capt. Stearns and Mr. Pierce, who, in my opinion, should be partly or entirely remunerated for the expenses incurred in trying to supply us with so interesting and useful an addition as the honey-bee.

CHARLES R. BISHOP.

After these failures no further attempts were made to bring the honey-bee to the Hawaiian Islands until after colonies had been successfully established in California. On the 21st of October, 1857, Capt. Lawton, of the ship Fanny Major, landed four hives of bees that had been shipped from San Jose, California. These four colonies, according to Dr. W. D. Alexander, were placed in Dr. Hillebrand's garden in Honolulu, and are reported to have thrived well. Two of these colonies were afterward purchased by the Royal Hawaiian Agricultural Society for \$100 apiece, and the other two colonies were purchased by private parties. These four colonies were the first honey-bees to become established in the Hawaiian Islands, and from them have descended many of the wild swarms to be found in the trees and cliffs of the mountainward regions of the islands.

CUT COMB HONEY.

Should it be Sold for a Low Price? Liquefying Honey by Solar Heat.

BY F. GREINER.

In the foreign bee-journals it has been no uncommon thing to see comb honey advertised "in tin boxes (Blech-Dosen), so many kilos for so many marks." These advertisements imply that the comb is being cut out of frames, and packed into the tin receptacles (flat boxes). We had been accustomed to look with contempt upon such a slovenly way of marketing comb honey. I flattered myself that we in America were marching at the head of the procession, and that "cutting" comb honey to be marketed was not to be thought of.

From what the editor says on pages 765—767, Dec. 15, it appears that we are falling in line with the brethren across the water, and

the method which we have been inclined to treat with contempt may soon be the popular one. If it is possible and practical, and meeting with favor among the consuming classes, to put up quarter-pound packages of comb honey in paper cartons it will be so with full-pound parcels. Eventually we may put up fifty-cent or even dollar lots in these paper boxes lined with paraffine paper.

Comb honey produced for this purpose is, of course, most profitably raised with shallow supers without separators, or in regular extracting-supers, frames either being filled with very light comb foundation or not, at the bee-keeper's option.

As the editor says, we shall sooner or later be compelled to give up the use of sections on account of the scarcity of suitable timber to make them. If we are prepared for this emergency we shall be the better off. In time of peace is a good time to prepare for war. Paper may help us out. Paper for the honey-containers, paper for shipping-crates! The greatest advantage, however, will be found in providing a super which is most congenial to the bees, one which they will not hesitate to fill. We shall be able to produce very much more honey with the inexpensive outfit, cheapening the product on both ends. There will be honey and money galore for the bee-keeper in the future unless he sees fit to divide the spoils with the consumer.

So far it does not look like cheapening the product to the consumer. Twenty-five cents for $\frac{1}{4}$ pound, or about four times as much per pound as the section honey is sold for in the large cities late years—that is the price named by the editor. I pity the poor consumer, or would-be consumer, of comb honey. May we expect to dispose of our comb honey at such a fabulous price? I do not think so. I think we must even cut the now established price by a good deal if we dare expect to sell such large crops of honey as we shall then produce. At the present price of 15 cents per one-pound section here in the country the sale is limited, and the largest portion of my yearly output has to go to the city. At ten cents per pound I might expect to sell a large portion in my home market. Lower-priced honey is the demand here, although it seems, since labor is paid so much more than formerly, that we as honey-producers ought to be paid better also by receiving better prices.

If cheap honey is demanded, why don't the honey-eating people buy extracted honey? might be asked. The answer is, because by far the larger majority of them do not want extracted honey even at half price. They prefer the most inferior comb honey, such as that from unfinished sections, dark honeys, even honey-dew-flavored honey, to the finest extracted. I do not understand why this is so. I have many times been shocked by hearing the above sentiments from people who, I had every reason to think, had been converted to the extracted honey. Others who had bought my best extracted for years, ceased to be customers for it when

they found that inferior comb honey could be had at about the same price. This state of affairs has been and is very discouraging to me, and there is no wonder that I have been inclined to give the Texas bulk-comb-honey production a trial.

I have hesitated on account of liquid honey granulating here in this climate so readily. I could not believe that people were willing to dig into a sixty pound-can of solidified honey after the comb.

LIQUEFYING HONEY BY THE HEAT FROM THE SUN.

Mr. Boardman's sterilizing method, see pages 769, 770, 1909, might give some relief. He can undoubtedly tell how long extracted honey must be exposed to the direct rays of the sun to prevent its granulation afterward. As was reported some years ago in *GLEANINGS*, we have liquefied honey in a solar. When it was assured by Selser and others that bottling honey hot would prevent granulation, we heated honey in half-pound tumblers in our solar and sealed it. We observed no difference between honeys heated on the stove and such as is warmed in the solar; but we did not leave honey in the solar long at any time.

The objection made to the solar machine was that the sun could not be relied upon at all times, and that artificial heat was, therefore, better, particularly so in the fall of the year when granulation occurs. This is true, and for this reason I have used my solar but little of late. When I attempted to liquefy three-pound cans full of hard honey, and I failed to shift the apparatus around with the sun at the end of the day, I found portions in each can still hard, and then I had to leave the cans of honey for another day. The next day, as luck would have it, it would be cloudy or partially so. There were times when the honey in these 3-lb. cans did not warm up in a week. This was disgusting. To liquefy honey in 60 lb. tin cans in this way is out of the question. If I were to build a large solar machine for heating honey I would use artificial heat in connection with the solar.

If found necessary to keep extracted honey in the sunlight for a long time, one will have to build a regular glass storage house and put up the whole crop in glass. This latter is not a very bad practice for one who has a demand for his honey in glass packages. I know of some who follow this plan. They need less tank room, for they draw the honey into their retail packages soon after extracting. When granulated the cans are treated to a hot-water bath, and the honey is thus speedily liquefied. After thus being treated it does not again harden for quite a while. This method may be less expensive than the Boardman sterilizing process. The great advantage a solar machine has is that honey is never overheated. This can not be said of the other plan.

This subject of sterilizing honey is a very interesting one, and many of us want more light on it. We should also like to know why honey granulates sooner when often handled. If a chemical change has been effected

by sterilizing in the Boardman way, is it possible that this change may be nullified by turning the bottle of honey over and standing it on the other end?

Naples, N. Y., Dec. 26.

[Our correspondent expresses pity for the consumer who has to pay 25 cts. for $\frac{1}{4}$ lb. of honey. While we share to a certain extent this feeling, yet when we come to consider the cost of the package, cutting up the honey into small squares, of taking care of the drip, and the further fact that the railroad companies must have a reasonable profit, 25 cts. is not out of the way; and we must not lose sight of the fact that comb honey put up in this way is a choice tidbit, and so far from being a staple it is a luxury. It is fully the equal of other choice desserts found in the Pullman diners.

Why not go out on a campaign, as the makers of cheap syrups do, and get something nearer the value of our honey in comparison with some of the stuff that ought never to go into the human stomach? If we bee-keepers encourage low prices and sell at low prices, there is danger that our product will go down to the level of table syrups when in fact it should go higher.

When $\frac{1}{4}$ lb. of comb honey is sold for 25 cts. we must take into consideration that it costs money to get these small portions before the trade, and that it must be of the very finest quality. Any thing but the very best would ruin the trade instantaneously. Travelers on Pullman cars, and patrons of high-class restaurants, do not care so much for the cost of an article provided it is of first quality. They are willing to pay the price for they have the money, and in our opinion it is not necessary to waste any pity on them.

It has been demonstrated that honey can be sold at a fair price providing the right kind of educative advertising is used. We must dissipate the notion that comb honey is manufactured, first of all. We must show that the flavors of honey vary as do the fruits from the orchard. We must show that our product is more easily digested than any other sweet known, and that, while it costs more, it is worth more. Why, then, be content to get a paltry 10 or 15 cts. per lb. for an article that is intrinsically worth 20 or 25 cts. as compared with other sweets.

Admitting that there is a demand for a low-priced honey, let us supply that trade with candied honey in paper bags, or extracted in tin buckets or paper pails. In this campaign of advertising we should show that extracted is just as good as comb honey. We must first of all convince the consumer that it is not glucose, but much better than glucose or any of the cane syrups.

Bulk comb honey can be sold in the Northern States; but retailers must be cautioned to keep such goods at a temperature not lower than 70 degrees Fahrenheit. A great many groceries have a temperature of about 70 during the day, while at night it goes down to nearly freezing, and Sundays it goes even below that. Bulk comb honey can not be

sold in such stores. It is doubtful if any sort except that which is candied could be sold in such places. This is one serious objection to chunk honey in the North.—Ed.]

NATIONAL BEE-KEEPERS' ASSOCIATION NEWS ITEMS.

The Wisconsin State Bee-keepers' Association was first to join the National in a body, and has ever since continued in that relation. It was also the first this year to vote to send a delegate to the National convention of 1910. Let other State and local associations do likewise, and thus build up both. The membership of the National to-day, Feb. 19, is 3600.

The Executive Board asks all to report to President York or the General Manager any suggestions as to how the National Association can be of more help to its members. Several suggestions have been received already, but others are wanted.

The revised edition of "Bee-keepers' Legal Rights" is now in the hands of the printer. A copy will be mailed free to any member requesting it.

There have been two more recent cases of bee-keepers sending in their dues and asking for help *after* getting into trouble. This is contrary to the constitution. No insurance company insures burning houses.

The poison-spraying of open fruit bloom in the Southern States has begun, and some apiaries are already affected by it. Complaints of bees spotting the washings hanging on lines in the South are coming in. The North will have similar complaints later. The long cold winter is likely to cause much spotting of washings when bees have their first flights. The bee-keepers should try to plan the wash-days and place their bees out afterward.

It has been suggested that the time and place of the bee-keepers' conventions throughout the country be arranged with the Executive Board of the National Association. If this is done, it may be that dates can be selected when certain officers of the National can be present at nearly all local meetings; and it may be that the system of meetings for the good of all can be planned, something like the various State fairs in the fall.

Director R. A. Morgan, of South Dakota, suggests that the National issue quarterly instead of annually, and save postage; also, the more frequent reports will help to create more interest among bee-keepers.

Director J. E. Crane, of Vermont, thinks it would be a good thing if the National would own and rent to members stereopticon views for bee-lectures, and thus better advertise the use of honey, and also have the National advertise in papers.

Thomas Chantry, of Utah, suggests that the dues of the National be increased so that there will be more money in the treasury for use in the interest of membership, and he would urge every present member to get in new members for the National.

Up to this date, Feb. 19, since the last National report was issued, the General Manager has received \$1.00 from each of 80 members, and 50 cents from each of 545 members. This far exceeds any other year for fifty-cent dues, and shows that the local associations are co-operating very nicely. The fifty-cent rate to local associations when joining in a body helps the National, both in number of members and financially.

Invitations for the 1910 meeting of the National have been received from Toronto, Can.; Buffalo, Albany, and Rochester, N. Y.; Nashville, Tenn., and Zanesville, Ohio.

The Executive Committee will not decide as to the time and place of the next meeting until, perhaps, the first of June, so there will be plenty of time for other cities to get in their invitations to the General Manager before the final decision is made.

There ought not to be very much trouble in getting the desired 5000 membership by the time of the National convention of 1910. There are now 3600 members, so that only 1400 more would be necessary.

Those who are in arrears in their membership dues are kindly urged not only to remit at once to the General Manager, but also, if possible, to get their neighbor bee-keeper to become a member also. In this way the 5000 membership could be gotten within the next sixty days. Why not do it?

N. E. FRANCE, General Manager, Platteville, Wis.



MRS. J. W. BACON'S APIARY OF LARGE HIVES FROM WHICH THERE WERE ONLY FIVE SWARMS LAST YEAR.

SHORT CUTS IN A QUEEN-REARING YARD.

Putting Bees and Queen into a Mailing-cage to Avoid Stings.

BY MRS. J. W. BACON.

I see you have trouble by getting stung when putting up queens to mail. I have worked at this for a number of years, and in putting up hundreds of queens this year I had my thumb stung just once. Try it this way:

Fill the candy-hole, and tack the wire cloth on all except the last hole at the end. Now turn the wire cloth back, not quite half way, and you will have a long narrow space to put your bees in. Hold the cage in the left hand, with the thumb over the opening. Catch the queen first, and the bees by the wings as they have their heads in cells of honey. If you hold the cage so the back end is up they will run into the middle space.

I wear an apron made of factory cloth, with a double pocket — i. e., a small pocket on the outside of a large one. The small pocket is for tacks and the large one holds my hive-tool, leadpencil, a small wing to brush bees with, and a dozen queen-cages.

When catching queens I take along a box with blocks of eggs; and if I find a hive without eggs I do not look for a queen, but give them a block of eggs. I can give out eggs and catch a dozen queens in less than an hour. The next time over, or in two or three days, I find queens laying in many hives to which I gave eggs; and if they have started cells I give them a virgin queen; and so it goes, a continual round for the season.

I use lard on my hands to keep the propo-

lis from sticking; and if the bees are cross a little honey on the back of my hands seems to quiet them.

THE ADVANTAGE OF A LARGE HIVE.

I see that large and small hives are discussed. Ours are about right. They have a tight division-board and chaff cushion on each side. We winter our bees on eight frames. One can easily make this hive large (fourteen frames) or small, in the spring. The strong colonies are soon ready for an extra frame, and sometimes we keep putting in frames until they have twelve. When we are ready to put supers on these hives we take out these extra frames of brood, shaking off the bees, and use them to strengthen weak colonies, thus reducing down to eight frames. The bees fill the supers immediately. You see I would not want a hive that could not be made large or small at will. Taking out the brood at this time seems to retard swarming. We had five swarms from sixty colonies last year.

Waterloo, N. Y.

[The plan you describe for putting bees in a mailing-cage is all right. We used to employ that method; but it took so much time that we abandoned it in favor of the plan that we described and illustrated. Our boys seem to prefer the faster plan, even if it does result in more stings to their fingers.]

If a colony be given a large amount of breeding capacity, such as can be afforded by a large hive there will be far less swarming than from one where the breeding room is limited. The bee-keeping world has not given this question enough thought and attention. Our columns are open to a further discussion of the matter.—ED.]



SYVERUD'S AUTOMATIC BEE-BRUSH.

As the comb is passed between the brushes they revolve in the opposite direction, thus wiping the bees from both sides at once.

AN AUTOMATIC BEE-BRUSH.

A Double Brush for Freeing Combs of Bees Almost Instantly.

BY L. A. SYVERUD.

In shaking bees from combs I have often thought how nice it would be if we could get the bees off quickly without scattering them too much. With this in mind I constructed a brushing-machine as shown in the accompanying illustrations. The device is what I call a rotary bee-brush, and it wipes the bees from both sides of a comb at one operation as rapidly as the comb can be handled.

In the first view the position of the comb is seen when it is ready to be passed between the brushes, the right hand just touching the cord, which, when carried out by the hand, revolves the brushes in the opposite direction from that in which the comb is moving, and instantly cleans it of bees, that is, the same movement that pushes the comb between the brushes pulls the cord which causes the brushes to revolve.

I like to have the bees drop at the entrance of their own hive; and to do this I have arranged a hopper in front of the brushes (not shown in the picture), to prevent the bees from being scattered too much. I place the machine in front of the hive and a little to one side, so that the hopper is directly in front of the entrance. I remove one comb at a time, give it a shake into the hopper and pass it quickly between the brushes; then swing it around to the back of the hive and put it directly into the comb box or bucket. The work can be done in much less time than by ordinary methods. Coiled

wire springs revolve the brushes back to their original position, and also wind up the cord ready for the next comb. Next season I expect to try foot power for operating the brushes.

Canton, S. D.

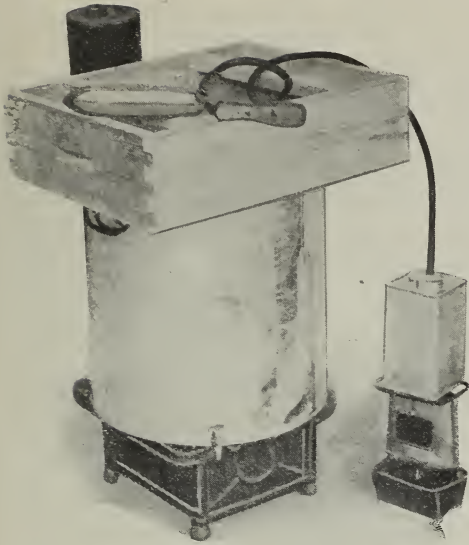
[Double brushes, for brushing *both* sides of combs at once, have been illustrated in these columns before; but Mr. Syverud has gone one better by making a revolving brush, the bristles revolving *against* the side of the comb. At first thought this seems like a good principle. It is a question, however, whether a machine like this can be carried around to each hive and adjusted to the inequalities of the ground, and in the end save time over a common hand brush. The roller brushes would need washing, probably, as often as any brush. —Ed.]

NEW INVENTIONS FOR EXTRACTED-HONEY PRODUCTION.

Some of the New Appliances Tested.

BY H. H. ROOT.

In the November issue of the *Bee-keepers' Review* Mr. W. Z. Hutchinson gives his experience with uncapping-machines, capping-melters, honey-knives, etc. After having tried the Ferguson uncapping-machine, described on p. 403, July 1, GLEANINGS his verdict is that, if combs are built with plain $\frac{7}{8}$ -inch end-bars, and are as straight and smooth as a board, and slightly bulged on each side, so that all of the capping surface projects about $\frac{1}{4}$ inch beyond the edges of the end-bars, but little more can be asked for in the



Steam uncapping-knife.—A gallon can over a double flat-wick oil-stove furnishes the steam necessary.

way of an uncapping-machine. However, although all of his combs are built on wired foundation, not one in four, he says, answers to the above requirements. Even when a comb is reasonably straight, he points out that one side is often slightly bulged while the other is correspondingly depressed, the result being that one side is uncapped perfectly while the other is untouched.

In our own extracting we also have given the Ferguson uncapping-machine a trial, and we agree perfectly with Mr. Hutchinson. We have not tried all of the uncapping-machines that have been described and illustrated; but in our opinion there are a few objections that will hold true with all. We believe that the mere cutting of the cappings and getting rid of them is only a part of the problem that presents itself. The real problem is to *uncap the depressed surfaces without complicated mechanism, the expense of which is prohibitory*. We are sure that an uncapping-machine may be built, and probably is built, which will uncap in a satisfactory man-

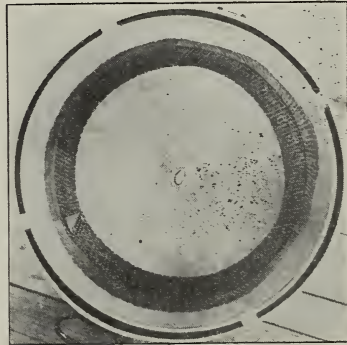


The Root capping-melter showing the removable circular screen. The square box is placed over the top of the can, and give plenty of room for the operator.

ner; but the question is, are such machines practicable? For the majority of combs, even should the machine do the work, it is probable that individual attention would need to be given to take care of the depressions, and we very much doubt whether much faster work could be done, in view of this, than a skilled operator can do with a good uncapping knife.

THE STEAM-HEATED UNCAPPING KNIFE.*

For several years we have believed that the steam-heated knife is the best solution of the uncapping problem; but we have hesitated to say very much about it for fear that there might be some objection to it that would come up after the plan had been tried extensively. Mr. Hutchinson calls the steam-knife a "daisy," and regards it as one of the "biggest little inventions of the apicultural times." The best thing about the steam-knife is that it does not get clogged or gummed up, and we have found that a razor edge is not as necessary as with a cold knife. A cold knife that is good and sharp works well until wax begins to adhere to the edge, and then the knife mutilates and tears the comb in a most aggravating way. This trouble



The inside of the capping-melter looking from above, showing the circular screen at the bottom.

may be overcome by dipping the knife in hot water, but this is only a partial remedy. The steam heated knife quickly passes through tough or tender combs with ease, and without breaking or mutilating the cells.

Much less force is needed, and the work is not nearly as tiresome.

A tea-kettle with the rubber tube attached to the snout by means of adhesive tape may be used for a boiler; but a copper can is better. If the tea-kettle is used, several thicknesses of cloth

* This device (or one quite similar) was first used in Europe. It appears to have been illustrated and described in several European bee-journals some years ago. We first showed it at the National Detroit Convention in 1908, although we had been using it a year prior to that time.



BEES KEPT IN A HEN-HOUSE WITH HOLES SAWED FOR THE HIVE-ENTRANCES.

should be placed over the opening, and the lid crowded down tightly to make a snug fit. A round disc of pasteboard inside the screw-cap on a can makes every thing steam-tight when the cap is turned down with the fingers.

THE CAPPING-MELTERS.

Mr. Hutchinson found that the large Beuhne capping-melter did satisfactory work when he removed the inner separator and allowed the honey and wax to run out away from the heat as quickly as possible. Whenever the inner separator was used, the honey was spoiled because of the long-continued heat; but when the honey was gotten away from the heat immediately, the flavor and color were not injured. Mr. Hutchinson did not find the Root capping-melter satisfactory, for the reason that it did not have enough capacity for the rate at which he was extracting. The one-burner Root-melter, as has been described in these columns, is not intended for the largest apiaries, where from two to five thousand pounds of honey is extracted per day. At this rate a larger melter must be used, and there must be two burners to furnish enough heating surface to get rid of the cappings as fast as they are removed from the combs. An improved strainer is now used on the Root melter, which greatly increases its capacity, but, at the same time, a much larger size is needed for the largest apiaries.

There is one point that ought to be mentioned in connection with capping-melters; and that is, that, if the honey and wax are not separated while hot in some such arrangement as the Aikin separator, which has been described before, the honey, if allowed

to cool under the layer of wax on top, takes on, in some way or other, a waxy flavor which is not noticeable if the wax cools by itself. We can not explain this; but we believe it to be a fact, since others besides ourselves have noticed it. For the best results, therefore, a separator should be used.

BEES AND CHICKENS IN THE SAME BUILDING.

BY W. T. BAILEY.

I started in the bee business with four colonies in the fall of 1908. Not knowing any thing about it I put the hives in the hen-house and sawed holes for the old-fashioned entrances to stick through.

I was so much interested in bee culture that I talked bees to every one I met, and one gentleman loaned me a very old and well-worn copy of a bee-book which proved to be the A B C of Bee Culture, by A. I. Root. This book made me a winner, and I have since felt very friendly to bee people, and especially to Mr. Root, and my gratitude goes out to him. From the four old colonies and two new ones last summer I secured about 150 lbs. of comb honey, which was sold at a good price. I now have ten colonies; am Italianizing, and expect to glut the market next year.

Suffolk, Va., has 10,000 people, two miles west of the Great Dismal Swamp, and is the biggest peanut center in the world.

Suffolk, Va.

THE MOTOR CYCLE FOR THE BEE-KEEPER.

Traveling to Outyards at the Rate of a Mile a Minute.

BY L. F. HOWDEN.

Having had three years' experience with motor cycles I am glad to relate my experience, as it may be of some benefit to those who run out-apiaries — particularly those who need some means of locomotion that is more rapid than the horse or even the automobile.

Of course, there is much pleasure to be derived from riding a motor cycle; but notwithstanding this fact I used mine mostly for business, having found it to be a wonderful money-saver by saving time, which is quite an important factor with a man who runs out-apiaries many miles from home.

Another reason why the motor cycle excels other means of travel is its low expense of up-keep. I have found that, after riding a two cylinder five-horse-power "Indian" 4000 miles, my expense for repairs has been only \$10.00 to 15.00, which is surely a small amount when one takes into consideration the distance traveled, time saved, and the satisfaction of having this willing steed always ready. The oil and gasoline required to run a motor cycle depend on the condition of roads, hills encountered, etc.; but I think that, as an average, a gallon and a half will run one a hundred miles.

The speed of a motor cycle is almost un-

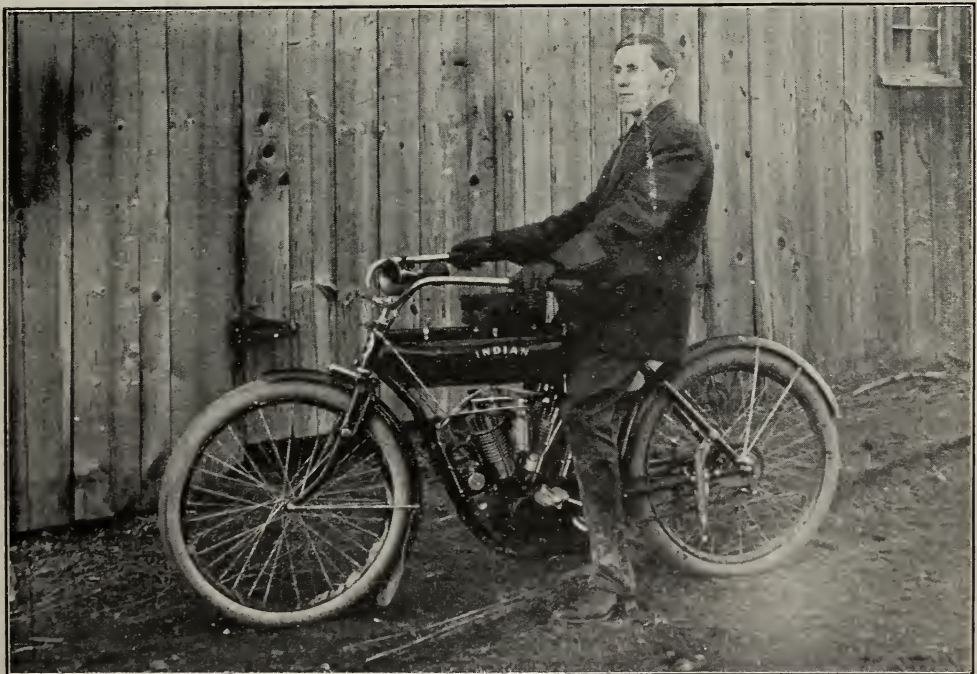
limited. I have traveled at the rate of a mile in fifty-five seconds, and there still seemed to be more speed in the machine. It is rather hard to tell what the maximum speed might be; but I think this rate is fast enough for the ordinary bee-keeper. It is also possible to throttle the machine down to five miles an hour.

As I have been in the supply business I had my machine equipped with a luggage-carrier which I used to quite an extent for carrying packages to and from the depot, having carried as much as 50 lbs. at once.

To those who ask how the "Indian" climbs hills, I will say that the five-horse power machine will climb any hill that an automobile or horse and wagon will negotiate. Those who live in a hilly country should buy the two-cylinder five-horse-power model selling for \$275.

Fillmore, N. Y.

[There are several good makes of motor cycles on the market. Besides the one mentioned in the article there are the following: Curtiss Reading Standard, Thor, Yale, Merkle, Pierce, and some others. The self-propelled cycle has now come to so high a state of perfection that it can no longer be considered an experiment but a practical everyday machine for business or pleasure. The expense, as stated by our correspondent, is very moderate. Something, however, will depend on the mechanical ability of the rider and his care of the machine. If he fails to keep his bearings well adjusted and oiled, and allows his machine to get out of



LEON F. HOWDEN READY FOR A LIGHTNING TRIP TO AN OUT-APIARY.



A. I. ROOT'S FLORIDA HOME, WITH A GLIMPSE OF THE TROPICAL VEGETATION ON THE NEW ACRE JUST PURCHASED FOR THE CHICKENS.

order, he may have some expensive repairs. If the directions of the salesman are carefully followed out, there is no excuse whatever for any unnecessary wear on the machine. The chief expense for up-keep will be for tires; and the cost even then will depend very much on the speed with which the rider drives, and whether he is careful to pick his way, selecting the best parts of the road instead of taking every thing as it comes—glass bottles, sharp stones, and all.

In this connection we would not advise any driver of a motor cycle to go faster than 25 miles an hour. This is fast enough. High speeds increase the cost of up-keep, to say nothing of the danger. While some of the high priced machines are capable of making a mile a minute, there is considerable danger at such speed. One young man in our locality, a fast rider, took a severe tumble, and was unconscious for several hours. It is a wonder that it did not kill him.

As between a double cylinder and a single-cylinder machine, the latter will take practically all the hills unless the grades are very steep. The two and four cylinder machines are a little quieter in operation, while the single cylinder gives off a sharp bark at every impulse. In localities unfrequented by automobiles some horses are badly frightened by the single cylinder exhaust.

It is our judgment that a good motor cycle can be very advantageously used for out-apiary work. The cost is insignificant when compared with an automobile; and when one does not wish to carry too large an amount of luggage he can make a trip to the

yards quite as satisfactorily as in a full-fledged auto.

Perhaps the average person feels that he could not learn to run an autobike. Almost any one who can run a common bicycle will have very little difficulty in learning to handle one of the self-propelled type. He should seek, however, to get all the "pointers" possible from the agency where he gets the machine. Then if he will be content to ride at a *moderate* speed and every day look over his tires, bolts, and nuts, and see that his machine is well oiled, he will have very little trouble.

Very good second hand autocycles are sometimes to be had at one-half or two-thirds the price of a new machine; ordinarily, however, we would advise the purchase of a new machine; and for out-apiary work we would get a luggage-carrier in connection. The price of the single-cylinder machines runs up to about \$200.—ED.]

THE MOTOR CYCLE FOR CARRYING SUPPLIES.

BY H. G. QUIRIN.

We note that we are to have several articles on the automobile and its use in out-apiary work. We are all interest, as for some seasons past we had been thinking of getting one for that very purpose. but for various reasons did not do so. Instead we bought an up-to-date motorcycle, for we figured that we could build a carrier on the rear, which

would enable us to carry 50 to 100 pounds. This, together with a horse and spring wagon we have, answers all right except in the fall when the bulk of the honey is taken off, when, of course, we require a two-horse wagon.

While the motor cycle fills the simple want of taking one over the road, it is not all that one might desire when it comes to carrying freight. In the first place, it has no springs and does not ride as easy; and in carrying bees and foundation it takes careful riding over the rough spots so as not to knock out the foundation and smash the combs; but by placing a thick cushion on the carrier, and wedging up the frames of foundation good and tight, one can carry them all right. When carrying bees and brood it is necessary to have the frames wired, and such combs selected as contain but little or no honey. Of course, old and tough combs which are well fastened at all sides are preferable to new ones at all times.

When it comes to speed, there is nothing to compare with the motor cycle, as most standard makes speed up to a mile a minute; but for rough, sandy, or muddy roads, they are no good.

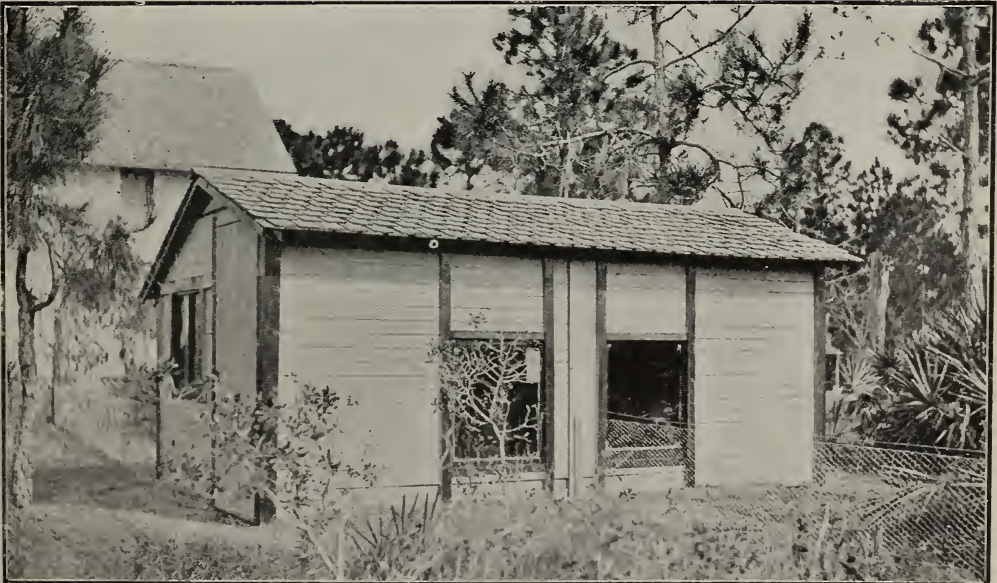
It seems to me that the ideal auto for a beekeeper would be of the high-wheeled type with friction-drive, solid tires, and built after the fashion of a spring wagon, motor to be air-cooled, and the rig capable of carrying about 500 to 800 pounds. There is a high-wheeled auto delivery in our town, which does an express business and has been running all winter through all this snow. I think it is an International.

Bellevue, Ohio.

A. I. ROOT'S FLORIDA BROODER-HOUSE.

Through the kindness of one of the readers of GLEANINGS from the North, who visited us with his kodak, I give you a glimpse of the brooder house I have mentioned, and also a view of our Florida home with some of the tropical vegetation in the foreground. The brooder-house is 8×14 feet, and is divided by netting in the middle so as to make two rooms, 7×8 feet each 4½ feet high on the north side, and 5½ high in front. Wesley and I built it, although neither of us is a carpenter. Almost every stick of material is cull flooring that costs here only \$12.00 per 1000.

The sills are 2×4, but all above the sills is this flooring 4 in. wide. The corner boards are flooring nailed together, and the siding is then nailed *inside* of these. I ordered cheap shingles; but as they were out, I took the best cypress and placed them two inches apart, as you will notice in the picture. I got two damaged windows to let the sun in on cool mornings. Each apartment contains a brooder with 25 chicks, and by shutting the doors as soon as it begins to get chilly at night you would be surprised to see how warm and comfortable it is inside until the sun gets up again next morning. On the north side are long shutters 2 ft. wide, that can be swung up under the eaves during very warm weather. The netting that goes down a foot into the ground keeps out all night prowlers; the joints are all tight enough to keep out cold winds and frost, if any should come, and the chicks have a dry warm place to scratch and exercise when it is damp or



THE BROODER-HOUSE THAT KEEPS OUT THE "VARMINTS," LETS IN THE SUNLIGHT, AND TEACHES THE CHICKS TO "GO IN WHEN IT RAINS."

rainy outside. Clear around under the eaves is a little long box or shelf where all tools and small things needed in the care of the chicks may be kept out of the way, where they can be seen at a glance, and where you can reach them without any stooping. My decision is, just now, that if you are going to run an incubator (even down in *Florida*) you need some sort of brooder-house. I do not think this one cost, labor and all, over \$40 00. Several who have looked it over have suggested it wouldn't be a bad place for *two people* to live in, in this genial climate, especially if the aforesaid "two people" had got tired of paying out money for rent, and, at the end of the year, having nothing to show for it. I might add that Wesley and I have built three similar houses for roosting and laying houses. These, however, have no windows nor doors except screen doors covered with netting. The whole south side is netting. Each house is shut up at night and opened at daylight.—A. I. R.

FASTENING FULL SHEETS OF FOUNDATION IN SHALLOW EXTRACT-FRAMES.

The Spoon and Melted-wax Plan Found the Most Satisfactory.

BY F. DUNDAS TODD.

In the shallow extracting-frames I use full sheets of foundation; but neither in those of my own make nor in those made by Root is there provided a wedge device for fastening in the sheets, so one must fall back upon wax as a cementing medium, or grip between two strips of wood. My preference is for wax.

When brought face to face with the problem of foundation-fastening I gathered together the literature upon the subject in the various magazines and books and compared them all. Mr. Hutchinson described one method that looked rather alluring—one in which a mixture of beeswax and resin is melted in an oil-can and poured from the spout on to the top-bar of the frame alongside the edge of the sheet. I will admit that, in Mr. Hutchinson's hands, the scheme probably worked first rate; but with me it was an utter failure. I tried two different sizes of cans, and experimented with various sizes of aperture; but the wax set in the nozzle on the first pouring, and then the fun began. For a while I tried boring out the hole each time with a nail, but soon the clogging worked its way downward beyond reach. Then I tried plunging the can into the hot-water bath with the nozzle down. This melted the wax all right, but soon there was more water inside than wax, while outside the wax was speedily getting on top of the water. Besides, I was burning my fingers, and while it is possible my digits may in due season become inured to bee-stings I am afraid they will never become immune to scalds from hot water. So the Hutchinson idea after a

fair trial was voted unsuited to this locality. Louis Scholl's spoon method looked sloppy and inherently lacking in nicety; but I have a high opinion of his opinions, so I decided to give it a trial. After a little practice, and getting the tools adjusted to suit my hand, I found the system exceedingly good, and now I can fasten a few hundred sheets of foundation into position in a little while.

The essential tools are a suitable spoon and a frame-rack. "Suitable" is a rather vague term; but I have tried tea, dessert, soup, and big cooking spoons, and my choice is the dessert size. Mine cost me about 5 cts. in a hardware store, and is made of iron with a plated surface. As I held it in my hand trying to figure out how the melted wax would flow from its lip, my mind went back to the "cruise" of fifty years ago—that is to say, the holder for the melted fat and cotton or vegetable pith that did duty as light-producer in the cottar homes of Scotland. In general outline it suggested a Bartlett pear divided the long way, the core and meat being removed. So I decided to shape my dessert-spoon along the same lines, which was accomplished by the free use of pliers and hammers.

So please picture to yourself the main part of the body of the spoon being used as a reservoir while the sides at the point are folded inward so as to form an open ditch about $\frac{3}{8}$ inch wide through which the wax may flow.

While the melted wax is being poured on the frame this must be held upside down with the sheet resting on the under side of the top bar. A support of some kind is emphatically necessary. My first was an experimental one to hold only one frame at a time; but once I had got the angles to my mind I made another to hold three.

Make a solid board frame of $\frac{3}{4}$ -inch lumber, 20 by 24. Diagonally across the face of it nail three cleats of the same thickness any convenient width, not more than an inch, the left ends (provided the cleats run clear across the board) being 3, 10, and 17 inches from the top, the right ends 10, 17, and 24 inches. Then, for plain frames of $\frac{7}{8}$ top-bar, make from $\frac{3}{8}$ -inch boards, such as one finds on boxes, three pieces slightly smaller than the inside dimensions of the frame, say 4 by 16. For Root frames the thickness should be $\frac{5}{8}$ inch. Nail these half an inch above the cleats, and the rack is ready. When in use mine stands on the bench with a slight backward tilt, being supported by a brace that is fastened to the back.

The wax is melted in a large jelly-glass that stands in a five-pound lard-pail containing water almost to the top of the glass. A small kerosene-stove is a convenient source of heat. The spoon usually rests in the water when not in use, so as to keep it warm and clean.

Every thing ready, three frames are placed on the rack upside down; then sheets of foundation are slipped into place. It pays to handle the sheet with great care so as to keep it perfectly flat and the edges straight. The best edge is dropped on the frame so

that there may be perfect contact all along the line.

Dip the spoon in the melted wax and take up about half its capacity. Bring it quickly to the left end of the top bar; turn the handle of the spoon away from the body and pour out the wax, at the same time running the spoon from one end to the other. The left hand, slightly resting on the upper edge of the foundation, presses it down on the top-bar, and at the same time the lip of the spoon presses the lower edge against the board, thus getting perfect alignment. The bar being on a slope, the melted wax runs rapidly downward, just enough being caught in the depressions of the foundation to make a perfect cement.

When all three sheets have been fastened, the frames should be reversed and the melted wax applied on the other side.

Lastly, a word of caution as to the handling of the frames once the foundation has been fastened. The wax sets very speedily, but it takes quite a while to harden, so the sheet of foundation must never be out of perpendicular. To reverse the frame, lift it off the rack and turn it slowly end for end. When the second application has been made lift the frame by both hands; lower one until the top-bar is perpendicular then change hands and bring the top-bar horizontal, proper side up.

The hive is, of course, the best place to store the frames until they are wanted for use.

Victoria, B. C.

THE LEGAL CONTROL OF BEE TERRITORY.

An Actual Case where No Law could Help Matters.

BY J. L. BYER.

With a good deal of pleasure we have read what Dr. Miller has to say in defense of his position on the question of the legal control of bee territory; and before going further I wish to make it clear that, while I may have intimated in a former article my inability to understand the doctor's attitude on this question, yet I never for a moment questioned his sincerity and honesty in the matter. I am placed in quite a difficult position in attempting to combat the arguments advanced, from the fact that the proposition on which Dr. Miller bases all his theories on the question at issue is, in our opinion, entirely untenable. I refer, of course, to the statement made by him that "if ever bee-keeping is to stand upon a firm basis like other lines of business, there must be such a condition of affairs that the bee-keeper shall feel just as secure against interference as the stock-raiser who is assured by the law that his fields shall be occupied by his cattle and his alone."

With all due regard for the opinion of others, I hold that the two cases are not at all

parallel; for before the stock-raiser has such privileges he must either own the land or pay an adequate rental for the same—something that it would be impossible for a bee-keeper to do in the many thickly settled communities where so many bees are kept to-day. As regards Australia and some other sparsely settled sections, we admit, as we did in a former article, that legal control of territory for the bee-keeper might be possible; but, as pointed out in that same article, conditions that are applicable in such places would be entirely impossible in the more thickly settled communities.

I have already stated that I regard the doctor's "foundation stone" as an impossible proposition in so far as bee-keeping is concerned, and I may as well say at once that my belief is that all who contemplate going into bee-keeping as a business may as well realize at the first that it is a business of many uncertainties, and be prepared to cope with the overstocking and other problems incidental to the calling, just as miners and others engaged in uncertain occupations expect the various ups and downs natural to the work from the very nature of the same. After all is said and done, it is gratifying to know that very few real bee keepers do encroach upon others, as here in Ontario, at least, it is quite rare to hear of a man moving bees near another who has located before him. At present I can recall only one instance that has come to my notice, and in that case one of our extensive producers moved right across the road from another bee-keeper; and I wish to say most emphatically that, unless there were mitigating circumstances that were not revealed to me, the bee-keeper who did the moving is about fifty per cent less of a man, in my estimation, than he was before I heard of the matter. As we have never been in the locality where this happened, all we have on the subject is second-handed, and we do not feel as well qualified to speak as though personally aware of all the facts.

The supposition that Dr. Miller advances regarding Mr. Jones moving to a locality suitable for maintaining 100 colonies, and then having another man move in near him with an apiary, is unfortunately too true in reality in some few cases; but when we go to *suppose* what would happen in a settled community where there were a number keeping bees, if a law were passed giving control of all the territory to *one* man—well, language fails me, and I can only appeal to imagination.

"There's no such conflict about a cow pasture; and why should there be as to a bee-pasture?" As we have already stated, the cow-man, in order to get such exclusive rights, either owns or rents *all* the land his cows roam over. Let a bee keeper comply with these conditions, and then the two cases will in a slight degree be parallel, and not before.

Right here at my home I have a case that is not in the supposition class; and after explaining the matter I will ask Dr. Miller to

mete out justice on the theory of each bee-keeper owning his own territory. More than 60 years ago my grandfather had an apiary of 100 colonies, or thereabout, where my home apiary is now established. Right across the road, about a quarter of a mile away, his brother, my great-uncle, had a like number of colonies. If I remember my grandfather correctly, he started with the bees a year or so before his brother did, and I want Dr. Miller to note this fact, for this means that I should have prior rights to the field. In course of time both of these men died, and my father kept bees at the home yard while a son-in-law of my uncle now has bees in the yard across the road. As already stated, my home yard is where my grandfather's bees were standing 60 years ago; and while, in former years, there was no apparent overstocking, yet now in the matter of spring feed there are entirely too many bees on the range. To get around this difficulty I have for the past few years been moving away part of the apiary in the fall, bringing them home again at the opening of the alsike flow. This, of course, means a lot of work, and, from a selfish point of view, I might wish that my relative across the road would reduce the number of his own colonies, or else that a law were passed giving me, as the exclusive bee-keeper, the rights to the range. As he has a farm as well as the bees, it is not at all likely that he will ever move away nor yet discontinue keeping bees; and, indeed, under the circumstances I have never considered such a thing in the least probable. What do I intend to do in the matter? Why, some time I expect to get a new location and move to it, even if it does cause me considerable expense and inconvenience. That course, or putting up with present conditions, is my only alternative, and really I do not feel like blaming anybody about it either. But *suppose* both of us decide to stay on the job, and go on increasing these two apiaries—how would any legislation regarding the control of territory work out in our cases? It certainly would need the judgment of a Solomon to decide the matter. To complicate the case further, there are, at a conservative estimate, at least forty farmers on the range in question, most of them owning their land and growing alsike. *Suppose* the majority of them are keeping a few bees, which in the aggregate make up quite a number on this already stocked locality, how would the proposed legislation work in their case?

The illustration given is not at all an exaggerated picture, as there are many cases just as complicated as this that would be revealed if ever such a thing as legal control of bee territory were thought of. The more I think of the matter, the more it appeals to me as being utterly impossible that such a law as advocated by Dr. Miller would ever be workable; and this being the case, I too would end this article with the same words as he did his, and warn all prospective bee-keepers that "No bee-keeper in this land has a legal right to his bee territory;" and may I

be pardoned for appending the prophecy that he is not at all likely ever to have such an assurance?

Mt. Joy, Ont.

STRUCTURE OF THE HONEY-BEE.

A Lantern Lecture by C. P. Gillette, of the Colorado Agricultural College.

Delivered before the Annual Meeting of the Colorado State Bee-keepers' Association, December, 1909.

[Bee-keepers are often surprised to find that the subject of apiculture is so interesting to the members of farmers' institutes, or even to a popular audience. We have mentioned a good many times that it pays a bee-keeper well to give talks on the subject of bees, and many have followed our advice with both pleasure and profit. We have had a number of requests for scientific data arranged in an easily understood form, and we are very glad to place this article by Prof. Gillette in these columns, knowing that it supplies this information in a popular form that can be easily made use of by those who desire to give practical talks on apiculture.—ED.]

Without the pictures this address can be given only in part. The following is a brief extract from what was said.

The honey-bee is, with the possible exception of the silkworm, the most important commercial insect. Although the bee is handled and cared for throughout its life by man, it can hardly be considered a domesticated animal. A colony of bees in the apiary differs from a colony of wild bees in a beehive or a ledge of rocks only because of the difference in the home they dwell in. The insect intelligence is not capable of being taught as one might teach a dog or a horse.

Bees do wonderful things to provide for their home needs and the care of the young; but they do all from instinct, and not from education received from others after they are grown.

The social habits of the bee are greatly to be admired. The family, though very large, numbering thousands, live together in the utmost harmony. The bee colony is often referred to as a true commune where each colony is a single family, and each family, consisting of one mother and her children, will oppose to the death the intrusions of neighbors, although these neighbors may be of the closest blood relationships, perhaps first cousins, or even full sisters that left the home a few weeks before to start a home of their own. So, between families the bee is not a communist at all.

There are many species of wild bees that are not used for commercial purposes, and many species of ants that, like the honey-bee, live in colonies, but in no case do these social insects permit members of other colonies to enter the home and disturb the property there collected.

There are a great many fossils of insects found in rocks of the earth's crust that must have been formed at a time long before man inhabited the earth. It is altogether probable that our honey-bee was present upon the earth gathering nectar and pollen, cross-fertilizing plants, and caring for its home, be-

fore the earth was in a condition to be inhabited by human beings.

We are also interested in the honey-bee because it stands at the head of its class, thus ranking in the insect world with man in the realm of higher animal life.

The honey-bee is a true insect, and is built upon a very different plan from that of the higher animals with which we come in contact. The body is divided into three very distinct portions—the head, containing the organs of special sense and brain; the thorax, which is the muscular portion of the body, and to which are attached the legs and wings for locomotion; and the abdomen, which possesses the organs of digestion, reproduction, and, for the most part, the organs of respiration and circulation as well. The number of legs in the adult insect is six, a number which we do not find in other forms of animal life. The heart is a mere tube with openings along the sides for the entrance of the body fluid, or blood. This fluid is forced forward by the pulsations of this tube, and poured out into the body cavity again to bathe the tissues. Insects do not have a closed circulation.

The nervous system, which lies near the dorsal surface in all vertebrate animals, lies close along the ventral surface in the honey-bee, as well as in all of the insects. The honey-bee breathes, not through nostrils located in the head, but through small openings called spiracles, which open along the sides of the thorax and the abdomen. Holding the head of a bee or any other insect under water would not in the least interfere with respiration. There are no lungs. The air taken in through these spiracles is carried by minute branching trachea to every living part of the body, where it supplies oxygen to the tissues and takes away the poisonous carbonic-acid gas. So the honey bee never has pure and impure blood side by side. The blood is all the time kept pure.

The honey-bee possesses about the same organs of special sense as we find in higher animals; but these organs are built upon very different plans. That the bee can see, smell, taste, and feel there can be no doubt, and possibly it can hear also, but upon this point there is some reason for doubt. Nature provides only such organs for its numerous creatures as are specially needed. The bee must see and smell or it could not find the flowers from which the food is obtained for both the young and the adult members of the bee family. It might be well to remember that all color in flowers, as well as all odor, is for the purpose of attracting the honey-bee and other flower-visiting insects to carry pollen from blossom to blossom for cross-fertilization. The flowers that do not need the insects to carry pollen in this way have neither beautiful colors nor any aroma to attract the insects, nor do they secrete nectar. If the flower blooms in the evening or very early morning, it is white or light yellow because these colors are most plainly seen in the dim light. If the color and size of the flower are such as to make it incon-

spicuous, then the odor is very strong so as to compensate for the lack of size and color in attracting the insect visitors.

Bees, like most other insects, pass through four very distinct stages in their development—the egg, the larva (or growing stage), the pupa (or resting stage), and the adult. The adult bee lives a few weeks only during the summer season; but those bees that mature late may live well into the honey-gathering season of the following year.

The bee, being a skilled workman (or workwoman), has highly developed instruments for carrying on its work. Among those that were shown upon the screen were the large compound eyes to see well with by daylight; the little ocelli, better adapted for vision where very little light is present; the eye-brush, used to clean all dust from the compound eyes that the vision may be clear; the compound hairs found only upon those bees that gather pollen, and especially adapted for the purpose of entangling the pollen grains as the bee tumbles about in the flower; the brush, by which all of these pollen grains are collected to be placed in the pollen-basket; and many other very interesting structures.

While the bee is of great commercial importance to man as a gatherer of one of the choicest sweets that we have upon our tables, it probably does even greater benefit in the cross-fertilization of the flowers of our agricultural fruits and plants, and so cause larger crops. There is some question, however, whether or not the honey-bee greatly increases the yield of alfalfa seed, as the flowers of this plant seem to be able to fertilize themselves without the assistance of visiting insects.

RESULTS OF BEE-KEEPING LEARNED FROM BOOKS.

A History of a Beginner's Mistakes and Experiences.

BY MARTHA K. PURSELL.

I have studied the theories and read the practices of bee-keepers until it seems I have all that books can give me. "Langstroth, Revised by Dadant," "Quinby's New Bee-keeping," "The A B C of Bee Culture," Miller's "Forty Years among the Bees," "Advanced Bee Culture"—these have been my text-books.

To look back on the work of the last few seasons is to laugh. It was a blind effort to use book methods without knowledge of underlying principles—a succession of mistakes, with changes often enough to prevent total loss.

CHAPTER ONE.

In the early spring one year I was in a run down condition of health with a pocket-book to match. How to change these conditions became the question. My physician said I should be more out of doors. My home, on the outskirts of a suburban town,

offered a suitable location for bee-keeping, so I finally decided to try that.

The initial proceeding was to subscribe for GLEANINGS. In order to understand terms used, several good books were read. This reading only showed how much I had to learn. I then subscribed for the *American Bee Journal* and the *Review*. Back numbers of GLEANINGS and the *Review* introduced me to Miller, Doolittle, Alexander, Townsend, and all the other lights of varying power which illumine the world of bee-keepers.

The diversity of methods seeming at first to contradict each other was a source of much confusion of mind. I worked at first, as many in every line continue to do, by the rule of thumb. My first order for supplies was:—

- 1 ten-frame hive nailed and painted, full sheets.
- 5 " " in flat, full sheets.
- 1 Danz. super ready for use, full sheets.
- 1 standard smoker.
- 2 honey-boards.

We had an opportunity of witnessing free demonstrations on a roof in Philadelphia. My twelve-year-old son, destined to be my assistant and successor, and myself were soon on hand to see how bees were handled. On May 15 we carried home a four-frame nucleus with queen. This is hive No. 1.

Before the supplies arrived I ordered from a local breeder of golden bees a two-frame nucleus and queen. These were to be called for on notice. The season being unusually late they were not received until May 25. Hive No. 2.

Later purchases of bees were as follows: On the last of June a one frame nucleus with extra bees and fine queen bought by the boy when the roof apiary was closed for the season. Hive No. 3.

A box hive of black bees purchased in July of a neighbor was drummed into a ten-frame hive filled with nine foundation-frames and one comb from No. 3. Their queen was lost, but they raised a fine Italian. Hive No. 4.

June 28 we attended a field meeting, and there heard that the season was over. We had supposed that there was always honey all summer, and wondered what No. 1 would do now if it grew strong. Perhaps it would swarm with the fine queen. We would prevent that, and we did, to our sorrow.

When it became apparent that we would get no honey from No. 1, our only hope, the gibes of the family determined us to get honey somehow; so I paid \$6.00 to another neighbor for an eight-frame hybrid colony. This neighbor had been keeping bees for several years, and assured me that he usually secured as much honey in the fall as in the spring. Result—all field bees returned to their old home. On examination, neither eggs nor queen was found. After waiting twelve days to see if the stray virgin had mated, we found no queen. Sent the boy to town to buy a fine Italian queen; introduced on the candy plan, only to find it dead a few days later. Growing desperate at this delay, but still hoping for honey, I inserted a cell raised in a baby nucleus from the egg. The queen resulting was superseded the fol-

lowing spring. Can you wonder that it gave us no honey and required feeding for winter? Hive No. 5.

The purchase of a queen Sept. 1, when the Ferris plan was so large on my horizon, completed the amount spent for stock during the year, which was \$25.50. This, and a bill for supplies, used and unused, of \$20.85 was on one side of my ledger and the other side was blank.

MISTAKES OF THE YEAR.

1. Putting in all the full sheets of foundation before they were needed.

2. Trying to get most of it drawn out by giving every nucleus a full set at once. Some of it was chewed into holes or propolized.

3. Changing to sectional hive too late in the season, and when the colony was not strong.

4. Trying to raise a queen in a nucleus from the egg.

Colony No. 1 could have been made to produce extracted honey if a shallow super had been given over a contracted brood-nest, as the ten frames were filled with honey when it was broken up, in an effort to change to sectional hive.

By the time winter set in, the bees were in this shape: No. 1 had ceased to be. This had been transferred late into one part of a sectional hive, and was thought to be strong enough in bees and stores to winter, but was found queenless and dead.

No. 2 was strong and full of stores.

Nos. 3 and 4 were in a ten-frame hive with partition between, *a la* Ferris.

No. 5 had a poor queen, and had to be fed for winter.

No. 6 was another hive, *a la* Ferris, made up from combs of No. 1, No. 3, and No. 4, with queen purchased in September in one side, and one raised from cell found in No. 1, after her queen had been killed in needless changes, in the other.

To be continued.

REMOVING BEES FROM THE CELLAR.

A Cold Day Should be Selected in Order to Prevent the Bees Stamping.

BY J. E. HAND.

It will soon be time to remove bees from cellars, and begin preparations for a bumper crop of clover honey, for which the prospects never looked brighter than now. All the clovers went into the winter in excellent condition, and the heavy blanket of snow has kept them so. Bee-keepers have every reason to be encouraged, and should put forth every effort to make the season of 1910 a record-breaker for honey production.

A good start is a long leap toward winning the race; therefore our success will, in a great measure, depend upon giving our bees a good send-off in the spring. This is very important. A mistake made at this point can not easily be rectified, and the result is often a lot of weak and unproductive colo-

nies that might have been profitable honey-producers had the bee-keeper performed his part in an intelligent manner.

WHEN TO REMOVE BEES FROM THE CELLAR.

The time of soft-maple bloom is usually considered the right time to remove bees from the cellar. Begin operations in the afternoon of a cold cloudy day, when the prospect is good for continued cold for two or three days. When a warm day comes the bees will fly out naturally, and, in the absence of any excitement, will mark their location and return to their respective hives. There will be no drifting, and, best of all, no robbing.

If bees are removed from the cellar on a warm sunshiny day there is bound to be a mixup, which is little less than a stampede. Bees will rush from the hives without marking their locations, and return to some other hive to which they may be attracted by an unusual commotion, and thus some hives will become jammed full while others will be weakened to such an extent as to give them a serious setback. Robbing is sure to begin, and will cause more or less trouble and vexatious losses until the honey-flow begins; for a bee once a robber is always a robber, and is good for nothing else. All this trouble may be avoided by exercising a little care and starting right.

When the bees are removed from the cellar it is a good plan to spread burlap sacks over the hive and push a telescope cap down over the whole hive and let them severely alone until settled warm weather. Nothing is gained by spring tinkering with bees except to feed liberally any that may be short of stores.

Birmingham, O.

[We particularly indorse our correspondent's recommendation as to the *kind* of day when bees should be taken out of the cellar. Beginners who have bees to take out would do well to follow these directions carefully. —ED.]

THE BEST PLACE FOR BAIT SECTIONS.

Comb vs. Extracted Honey.

BY CHAS. D. WEST.

Since my brother was killed (in July, 1907) I have been in the bee business with my father, Mr. N. D. West. We are running 500 colonies, all for comb honey except 80, which we run for extracted. We use an eight-frame automatic extractor run by a gasoline engine. We find it saves us time and labor. The engine is also used to run our saw. Until we bought the engine and extractor we did our extracting by hand, and our saw was run by horse power. The engine is safer and more convenient.

In the Jan. 1st issue I read an article by H. E. Crowther, on the best place to put bait sections. If he will pardon me I will make an infringement on it (not a criticism).

WHERE TO PUT THE BAITS.

I am inclined to think the center of the super is the best place. We have also used bait sections both ways, and obtain better results in the center. Bees usually begin their work in the center of the brood-hive where most of the eggs and brood are found. If a hive is opened on a cool morning, most of the bees will be clustered in the center of the hive, where the brood is usually the thickest. If the cover is raised from the supers on a cool morning, and the bees are there, they will be in the center of the super, even when no bait sections are used.

The hive we are using needs two supers to cover the top; and by using the bait sections in the center it requires only half as many. After the bees are up in the sections, and working well, they will stay there as long as the honey-flow is good and they are kept strong.

THORNS FOR SUPPORTING FOUNDATION.

Mr. Crowther's idea of the short splints in the top-bar to prevent the foundation buckling is a very good one. A few years ago, I remember, my father used long thorns in the top and end bars to prevent buckling; also to serve as supports to keep the foundation from falling out while being carried from one place to another and while handling. Since bee diseases have been in this locality, we have discarded the use of the thorns, and use foundation which is wired vertically and horizontally. This keeps it from buckling. The thorns sometimes bother about removing the combs when they are to be made into wax or when they melt out.

EXTRACTING-SUPERS OVER EXCLUDERS.

Until the last three years, we have run, for comb honey, about 500 colonies in five different apiaries. The last three years we have been running one apiary (our home apiary) of 80 colonies, for extracted honey. From this yard we get more honey with less work. The production of extracted is not only labor-saving, but can be looked at from the financial standpoint as well. One hundred good colonies run for extracted honey will produce more pounds of honey than the same number run for comb honey. The past season we got more honey from 76 run for extracted honey than from 100 which were run for comb, about two miles distant.

Excluders do not interfere with the storing of honey. As early in the spring as the bees are strong enough we put on a super of extracting-combs *without* the excluder, and let the queen lay in the super as well as in the brood-chamber if the combs above are in proper condition. By this method there are two hives of brood, which are better than one. Of course, this super must be put on in time. The queen, after the super is full of brood, is put in the lower hive, with the excluder between. The brood in the super is allowed to hatch in time to help gather the honey-flow which is to be on hand soon. By using this plan the colonies will be a half stronger in bees.

This is also a fine way for making increase.

By having bees hatched in the super they will return to that part of the hive with the nectar which they gather. This induces the bees in the lower hive to store the honey above, and save the lower combs for brood.

Middleburg, N. Y., Jan. 24.

[It is generally conceded that more extracted can be produced under the same conditions than comb honey; but how much more is a mooted question.—ED.]

"DRIFTING" AFTER MOVING OR SETTING BEES OUT OF A CELLAR.

What is "Drifting"? A Discussion of the Conditions which Cause it, and the Remedies.

BY R. F. HOLTERMANN.

The question often presents itself, as to how we can prevent bees, under certain conditions, from drifting. By "drifting" is meant the tendency bees have to fly out of their hives in considerable numbers, and, instead of returning, go to a new location in the apiary. This may result in the bees being attracted to the most populous colonies, or possibly from one end of a row to another, or from one side of the apiary to the other side. This condition occurs most frequently during the first flight in the spring, particularly when the bees have been wintered indoors under unfavorable conditions. Another occasion for drifting is when bees are moved from one location to another in the summer. There is also, in rare instances, a tendency to drift when a swarm issues and returns again. The bees of such a swarm scatter somewhat into every hive in a row, etc. This latter, however, does not come properly under the occasions for drifting, although we will consider it later.

To remedy the conditions given we must find the causes—the principal one, in my estimation, being excitement on the part of the bees so that they do not mark their location as they leave the hive, and move, therefore, toward a stronger attraction elsewhere, which attraction generally consists of flying bees or clustered bees that are visibly attracting others to them.

Another cause is the wind, which may blow the bees to one side of a bee-yard, and, as they recover control of their motion, they collect in front of the most convenient hive, and the one manifesting the most life, having forgotten or lost their own entrance; and as the flying bees increase in numbers, others keep coming. This is particularly true when colonies are set out of a cellar after having wintered poorly, when the consequent rapid changes of conditions from inside atmosphere to the outside increase the excitement of the first fly. The proximity of one hive to another has an important bearing on the matter, as does also the order in which the hives stand, the bees of hives standing in rows being perhaps more likely to drift.

MOVING BEES.

When bees are moved from one location to another during hot weather, to a new pasture for instance, so that they have been confined to the hive, they get excited, especially if they are confined when it is light, and if, during the day, the hives are opened, the bees are quite likely to drift—perhaps in several ways. The end of the row at which the hives are first opened is the end toward which they naturally turn. After that, unless enough time has elapsed so that the first uproar has quieted down, within moderation at least, one may open the hives anywhere, and yet the bees will keep drifting toward the end where the first and greatest excitement is, although they may follow a row. The principle in drifting appears to be this: A temporary excitement causes the bees to forget the instinct of returning to the place they left, so that they are drawn to the new home by other interests. It is always a question in my mind as to whether bees would not return to their own hive if the conditions were unchanged since the last flight. By this I mean that, if every colony is set out from the cellar and placed on the stand occupied last year, would not the bees, after an excited flight, be more likely to return to their own hives? Or if, after colonies are moved in the summer, would the bees have less tendency to drift if the hives are set in the same relative position to themselves and the other objects?

REMEDIES FOR DRIFTING.

In setting out colonies in the spring, if the cellar can be well aired the night before, and the hives set out before daylight, on a day when it is no warmer than necessary for safe flight, and preferably on a cloudy day, if warm enough, the conditions are not favorable to drifting. The fewer colonies set out at one time the better, and the further apart the hives are placed the less the bees are attracted by other colonies. If a bee-keeper does all in his power to secure these conditions I think he has done his best. I have said nothing about securing ideal wintering conditions; for if a bee-keeper has not already attended to this there is no use in suggesting to him any thing of the kind, for it is too late.

Some may ask how they can secure all the above combinations; but it is not for me to say how, for, as in many other things, we have an ideal or pattern, and our skill and experience must aid us in attaining to it.

When colonies are moved I like to set the hives on their new stands during the night. Then after the entrances are opened the bees quiet down before trying their first flight. In my experience this has always prevented drifting. When this can not be done, an excellent plan is to sprinkle the bees well with water before the hives are opened; and if they get a light shower bath as they come out of the hives, all the better.

DRIFTING OF BEES FROM A SWARM.

Jacob Alspaugh once said to me that if the hives were close together he would prefer not to clip the queens' wings, for he would

rather lose an occasional swarm than to have the returning bees of a swarm from a hive with a clipped queen scatter, as they often do, into other hives, so that, if these other colonies are strong, they too are likely to get the swarming impulse. Mr. Alspaugh said further that he had marked quite a number of hives into which bees from returning swarms had entered, and these colonies soon wanted to swarm. The only way in which I can explain the action of the bees of a normal swarm, when returning on account of having a clipped queen, and entering other hives, is that there is a stronger attraction than that at the old home. In such cases the bees seem to be determined not to go back to the old location.

Brantford, Can.

WHITE-CLOVER PROSPECTS.

A Bumper Crop Predicted for 1910; if the Clover is in Good Condition Nov. 1, of any Year, Prospects for a Honey Crop are Favorable for the Following Season.

BY VIRGIL WEAVER.

[Mr. Weaver is the man who predicted a scant white-clover honey-flow in 1909, and who, in spite of the opinions of nearly all of the writers to the contrary, held to his prediction until the season proved that he was right. He believes now that, in most localities at least, there will be a record white-clover yield in 1910. In view of his past record, the following article deserves careful attention.—Ed.]

I began bee-keeping in 1893. I had read Root's A B C, Doolittle on queen-rearing, the bee journals two years, and had studied bees nearly all my life. I ordered 25 hives from the Root Co., and purchased ten colonies of black bees in box hives; transferred them to eight frame hives, and patiently waited for the honey-flow. Very little clover showed up; no honey was harvested; so by studying the bee periodicals closely I came to the conclusion that the clover had winter-killed. When 1894 came I had 17 good colonies. We had a very mild winter, so felt pretty sure that the honey-flow would be good. The conditions in the spring being very favorable for the growth of white clover I could not see why the honey failed. Then 1895 and 1896 gave the same results. Four failures in succession reduced my bee fever to the 80's, and I was just about ready to give up. One thing I had noticed was that, preceding each of the years mentioned, it had run from very dry to moderately dry, especially in July and August. The year 1896 changed the program exactly. We had a dry spring; July gave a rainfall of 8 inches; August more than 6, and September was very little better, giving about 5 in. The winter following was about normal; the spring of 1897 was very favorable, and the honey secured from white clover averaged 150 lbs. per colony. The year 1898 gave 100 lbs. per colony, and 1899 gave 300 lbs.; the winter of 1898 was the coldest on record in my locality, zero weather extending into March, freezing and thawing continually. This 300 pound yield after so severe a winter was a little

contrary to the teaching of most of the old bee-keepers, and right here I began watching for the combination that it took to make a honey-flow from white clover. Prior to this time I shared the opinion of other bee-keepers, that conditions are nearly always normal for a yield from white clover on Nov. 1, and that the winter months virtually control the honey-flow. But by watching very closely, and also studying Weather Bureau statistics, I have learned that, if white clover is in a normal condition Nov. 1, it is also in a normal condition April 1, and that the winter months have no more to do with the white-clover honey-flow than Adam's off ox.

On May 9, 1907, I wrote an article for this journal, telling the bee-keepers of the northern part of the white-clover belt that there would be nothing doing in the white-clover line that year, but that in my locality, and the southern part of the white-clover belt, our prospects were good for a flow. That year I sold 22,000 lbs. of honey from 180 colonies of bees. To bear my former statement out, N. E. France said that he could count on his fingers all the parties who had a honey-flow that year. In the spring of 1908 I made no honey forecast, because, being located on the southern side of the white-clover belt, I was hopeful of getting some of my honey off at the high price before the deluge came from the North—something I was mistaken in. In February 1st GLEANINGS, 1909, I had another article, telling the bee-keepers that east of the Mississippi River there would not be a tenth of a white-clover crop that year; but didn't Miller, Root, Doolittle, Hand & Co. do me up! What was the result? The editor, after bringing in Canada, which gave a yield from alsike clover, and including all the alsike and sweet clovers and basswood honey, said that there was from 25 to 50 per cent of a white-honey flow. Now, if you will except the above-named sources it is a serious question in my mind whether there was a single carload of surplus white-clover honey gathered from the Mississippi to the Hudson River.

Now I have a different story. Instead of no honey, I want to say that there will be a bumper crop this time in most of the clover belt east of the Mississippi River. When I say "white-clover belt" I mean those localities where white clover grows spontaneously. The best of these localities are the Blue Grass sections of Kentucky; Ohio, Indiana, Illinois, Missouri, Iowa, Southern Minnesota, Southern Michigan, and Southern Wisconsin—Iowa and Northern Illinois being the heart of this belt. Draw a line from Dubuque, Ia., to Springfield, Ill., thence to Indianapolis, Ind., thence to Louisville, Ky., thence south; in nearly all the white-clover belt east of this line the white clover is in a normal condition; i. e., a crop of white clover started from the seed in the spring of 1909 which grew continually, caused by a surplus of rainfall, and, under favorable conditions, will produce one of the largest honey-flows on record in 1910. The honey crop for 1910 now depends on normal rainfall and sunshine

after May 15, not on the amount of snowfall or freezing and thawing we have during the winter months. The snow helps in just this way: It leaves the ground with plenty of moisture in it in the spring, thus inviting more moisture when the clover has got to have it. The condition west of this line is just this. The clover here was cut off from moisture about July 10, and has set only a moderate amount of embryo blossoms to bloom this year; and the best that can be hoped for in this section is a moderate yield. The reason I say this is that July and August are the most important months in setting embryo blossoms for next season's crop of honey; and the greater the rainfall in these months, the larger amount of embryo blossoms set. At this period the other grasses are taking a kind of rest. Blue grass has set its crop of seed; the meadows have been shorn by the mower, and have not started yet on a new crop of fall growth, thus giving a crop of new white clover a chance to spread itself, which, with plenty of moisture, it certainly does to a king's taste. In a great many places of this section the rainfall almost vanished after July 10—Cairo, Ill., for example, giving but a trace of rain for August. West of the Mississippi and South of the Minnesota line conditions are not very favorable for white-clover honey. Iowa is hit hardest, as there are whole counties in that State that will not produce a pound of surplus white-clover honey this year. I have no government data covering Missouri and Kansas; but through an unofficial source I have learned that a good part of these States were hit hard by fall drouths in 1909, there being about seven weeks without rain, beginning July 10, in large areas of this section. In Missouri, as there was no honey last year to speak of, and where the rainfall was excessive until July 10, there ought to be some honey this year. I want the snow-honey fellows to watch Iowa this year. The ground there in most parts of the State has been covered with snow since Dec. 1, and I say that there will not be half a yield from white clover in that State in 1910. Snow does not set embryo clover-blossoms. It takes a temperature from 75 to 90 degrees, and from three to six inches of rainfall per month to do the work.

I will now tell what kind of weather we need to make a bumper crop of honey in 1910. As I have said before, wherever the clover is in a normal condition Nov. 1, it will be in a normal condition April 1. To get best results after April 1, could I have my own way in my locality I would have good rains to soak the ground thoroughly as soon as warm weather comes, the last rains to be May 1; then I would have three weeks of dry weather—this to make the clover fill the ground with feeders to gather plant food and moisture; then I would have good rains to soak the ground thoroughly again; also as much as an inch of rain every eight or ten days; then we would see the greatest yield from white clover that any combination of circumstances could make.

Now, it may happen that, where the clover is not in the best condition now, conditions will be good for a honey flow; and where conditions are most favorable now for a lack of or from too much moisture, it may cut the honey-flow short; but taking conditions as a whole, to have clover in a normal condition Nov. 1 is five points out of ten in securing a honey-flow.

In speaking of a normal condition for white clover, there are two conditions where clover is in a normal condition, one which occurs but about one year in five. It occurred in my locality in my 17 years of bee-keeping as follows: 1897, 1902, 1906 and 1910. At Dr. Miller's it occurred 1897, 1903, 1908, and 1910. Now, as it will be two or three years before this condition can occur again it makes it for the two locations about one year in five as stated above. This condition is a crop of white clover, the greater part of which has started from the seed the year previous, and has covered the ground thoroughly with plants that are in the best condition that it is possible to put them in. These are the plants that, under normal condition, in the best of the white-clover belt, will yield honey for three months. The other condition, which is also a normal one, but which at Dr. Miller's, or, in fact, all the best of the white-clover belt, will not produce under the same climatic conditions more than half as much honey as the condition first mentioned. It is where these plants started from the seed in 1909, and have developed a greater part of their blossoms in 1910. Then these plants set new plants from their runners, and these new plants set new embryo blossoms that blossom next year, but the bloom period being about half as long the second year as the first. This will continue for a year or two, then they fall down from overcrowding or drouth. In my locality clover never fails from overcrowding. As I am on the extreme southern side of the white-clover belt our soil is not as strong nor as well adapted to white clover as it is north. There is no combination of circumstances in my locality that will make white clover yield honey later than July 10, while in the best of the clover belt it will yield honey for three months or more.

Richmond, Kentucky, Feb. 28.

SUPPLYING NEEDED STORES IN THE SPRING.

Pouring Syrup into Empty Combs Instead of Feeders; some Advantages of the Plan.

BY GEO. SHIBER.

More than twenty years ago, when Dr. Miller wrote "A Year Among the Bees" he gave in that book his plan of feeding by filling empty combs (regular brood-combs), with sugar syrup and putting them right in the hive. The doctor pointed out that in this way one always has plenty of feeders; for if all the combs are full there is no neces-

sity for feeding; and if they are empty, there are plenty of feeders, of course. He cautioned his readers against allowing any excitement that might bring on robbing, and advised inserting the combs late in the day so that by morning, every thing would be cleaned up. In his later book, "Forty Years Among the Bees," I note that he has abandoned comb feeding, and uses regular feeders instead.

For fall feeding, when one wishes to feed a large quantity quickly the feeder plan may be the best; yet for both fall and spring feeding I still think the combs are the most satisfactory. There are never any feeders lying around in the way, and I am never bothered by leaks when I put them in the hives, caused by shrinkage, etc. The real value of feeding in the combs is in the spring. It very often happens that I have a number of colonies that are short of stores when they come out of winter quarters. I realize that it is better to have them fed sufficiently in the fall to last until fruit bloom; but although I have tried to provide sufficient every fall, I have not yet succeeded in having *all* colonies come up to fruit bloom without more or less feeding. By the way, I do not know how we can make dollars grow any faster than by giving strong colonies an abundance of stores, so that they will never be short during the breeding period preceding the flow. Many times I have lost money by allowing good colonies to go through this trying period a little too near the "pauper line," for just as surely as the sun rises, the queens will slacken their egg laying if the honey is getting scarce and no more is in sight.

I have done but very little real stimulative feeding—that is, feeding a little every day or every other day. I do not know whether this would pay me or not; but if a colony is short of stores in the spring I usually insert two combs of two-to-one syrup, which will amount to six or seven pounds. I do this toward evening, and then, a week or so later, I can repeat the process if necessary. If I have any dark honey I use it up in this way.

I realize that the strain of bees is important; but providing an abundance of stores during the spring months, or at any time when colonies are being built up for an anticipated flow, is important too. It may be urged that filling the combs is too much work; but it is not when one learns how to do it. Dr. Miller, in his first book, described his way of filling the combs by punching the bottom of a can full of holes and holding this full of syrup over the combs to be filled. I usually follow a method of my own, and it is much shorter than one would think. The syrup should be warmed to about 120 degrees Fahr. I use a large dishpan over which the comb may be inclined at an angle of about 45 degrees, and dip up the syrup with the cup and pour it into the cells, holding the cup about a foot from the upper end of the comb. As the syrup runs down the comb the cells are filled more or less. Then

I keep working down with the cup with a sort of drenching motion, turn the comb over, and repeat the process on the other side. I place the filled combs in a hive-body which stands over a large pan. I never timed myself, but I can fill fifty combs in a very little while.

The colonies that I want to feed are previously marked, each hive being marked with the number of combs needed, and the space for such combs left in readiness. Toward evening, with a smoker, I quickly insert the combs and cover every thing up warm. I have found that bees will take syrup from combs when they will not work in a feeder on account of cool nights. If I had only twenty-five or thirty colonies I might take the time to fuss with feeders; but with a larger number it is much quicker and easier to feed in the combs. The more fussing there is to the work of feeding, the more one neglects it. I usually make the syrup a little heavier than two to one; perhaps it is often as thick as three to one. Even in the spring I think it is a good plan to have the syrup at least as heavy as two to one.

Randolph, N. Y.

ITALIANS COME OUT IN COLD WEATHER MORE THAN THE BLACKS.

On cold days the Italians are out at work when the blacks are not. On these cold days take some of them to the fire, and they will crawl as soon as they are warm. There is not a week here but that bees can work in winter; but the Italians try to work when they can't get back safe. Some get back home, but fall in front of the hive. If they are warmed they get over the cold; but if not they die.

Hamburg, La.

F. M. MORGAN.

A FLOOD FOLLOWED BY COLD WEATHER; BEES FROZEN TO DEATH.

On the 15th of November we had very high water which overflowed the bottom lands. I had my bees up on trestles high above the water. I couldn't take them down on account of the still threatening flood conditions. Then there came a sharp freeze while the river was high, and threatening. It turned so cold that ice was $1\frac{1}{2}$ inches thick over the ground. I find my bees are all frozen to death. What had I better do with the combs—melt them into wax or try to get bees and queens and put on them in the spring? I had only eight hives, the flood of 1908 having washed away 35 for me.

AMOS PIATT.

[If the combs are reasonably good we would advise you to buy bees and put on them in the spring. If they are old or crooked, or the frames are poor or a misfit, melt them up.—ED.]

HAS ANY STOCK BEEN STUNG AT WATERING-TROUGHS?

I wish to inquire if you have ever known of a case where bees that have frequented the watering-troughs of swine had gotten in the feed, been swallowed with it, and in turn had stung the mouth or throat of the pig, causing complications that resulted in the speedy death of the animal. Or have you ever known of pigs given orchard range being killed by the stings of bees that had been eaten along with the fallen fruit?

Aiken, Md., Feb. 19.

J. FORD SEMPER.

[We do not recall a single case where any animal—horse, cow, or pig—received a sting in the throat when drinking water at a trough that bees frequented. Even if the animal were stung in the mouth we doubt very much whether any serious consequences would follow. Neither have we known of any case where pigs given the range of an orchard had been stung from eating apples that the bees were visiting. If any of our readers know of a case of this kind, will they please report?—ED.]

HEADS OF GRAIN FROM DIFFERENT FIELDS

SHIPPING CARLOAD AND LESS THAN CARLOAD SHIPMENTS OF BEES.

We intend to move to Salem, Oregon, about March. We have about 85 colonies of bees; and as we could not dispose of them here to good advantage we will take them, together with supplies. I should like some advice as to packing. Would it be safe to remove both bottom-boards and cover, using screen securely fastened on, and leaving an air-space between hives, say of one inch? Would it be necessary for some one to go with them, or are they just as well if packed well? The railroad companies say they can not give a pass with the car.

Can you give me any information about Oregon, west of the Cascades, as to honey production?
Chatfield, Minn., Jan. 31. E. MONETTE, JR.

[We would not advise you to try to ship only 85 colonies of bees by freight from Minnesota to Oregon unless a man went along with the bees. If, however, you are going to send a whole carload of household goods, and the bees can be accommodated in the same car, it might be practical to ship the bees, if there were no transfers, even if the man did not go along; but it is better to have some one present with the bees to give them water occasionally if the weather is a little warm. Usually it is not practical to ship less than a whole carload of bees by freight. The western freight classification requires that a man who accompanies a carload in this way pay regular passenger fare, at the same time sign a contract releasing the transporting railroads from all liability from any injury to passenger riding on such freight trains.

If you ship the bees in March we would advise using only just a screen on top. This should be nailed on a two-inch rim of the same dimensions as the top of the hive. This is for the purpose of giving clustering room under the frames.

Frames, whether self-spacing or unspaced, should be securely fastened in the hive by means of wedges. Hives should be loaded with the frames parallel with the rails. But before putting the hives in the freight car, four or five inches of loose straw should be thrown on the car bottom, hives laid upon the straw, and then secured to each other and otherwise braced in the car. We never advise shipping bees by local freight unless they can go right straight through without transfer to point of destination, and not take more than 48 hours. Even then the hives should be cushioned on straw and securely braced in the car.

When a man goes along with the bees he should be provided with a water-pot, and water the bees every now and then, if they are clustered tightly over the wire cloth. When the car passes over the mountains, loose quilting or something should be laid over the top of the wire cloth to prevent the bees from getting too much chilled.—ED.]

ABSORBENTS VERSUS SEALED COVERS.

I have read the article in GLEANINGS for Feb. 1 by L. C. Wheeler and your reply. Before the winter closes I wish you would try an experiment; but first I will tell you how I pack my bees for winter.

Over the frames I spread a piece of burlap, and on this I set a chaff tray made like a super, of four-inch lumber, with a piece of burlap tacked on the bottom. This is filled with planer shavings, and they are heaped up in the middle so as to be thicker directly over the cluster.

Last winter I saw the difference between a cushion and one of these trays. When I packed my bees for winter in October, 1908, I was short of trays, so I put into a burlap sack enough shavings so that, when it was spread out over the top of the frames, it made a cushion about four inches thick. In February of last year we had a very warm spell that followed a very cold spell of weather; and when I looked at this hive that had the cushion instead of the tray I found that the cushion was wet and frozen around the edges, and the frames below were damp and moldy. None of the other hives that had trays were that way. I took this cushion off, put on a chaff tray, and in about a week, when I looked again, the hive and packing were dry. I use the Hilton and the Woodman hive, and can see no difference in wintering. The Hilton has thicker walls, but the Woodman is made of heavier lumber.

I wish you would have two or three of these chaff

trays made, and put them on the hives that have the wettest cushions, and see if they get wet like the cushions.

The top layer of shavings directly over the cluster is usually a little damp—much more so with some colonies than others; but the hives are dry and clean in the spring, and our winters are long, and the snowfall is usually heavy—especially so this year.

Benzonia, Mich., Feb. 5.

JOHN A. VANDEMAN.

In our reply to Leon C. Wheeler we did not explain that we were using chaff trays, the same as you are, and that we had been using such trays for many years back. If you were to carry the experience a little further you would find there would not be much difference between a loose chaff cushion, fitting on top of the hive, of a suitable size, and a chaff tray. The only merit of the tray, in our judgment, is that it is a little neater, and makes a little better contact on top of the hive. As usual we are trying several different ways of wintering, using sealed covers and absorbing cushions as well as trays. The result of the experiments will be given in the spring as heretofore.—ED.]

BEE-KEEPERS' INSTITUTE IN SYRACUSE, N. Y.

On Wednesday, Feb. 9, a bee-keepers' institute was held in the City Hall, Syracuse. This was one of a series of institutes provided for by the State Department of Agriculture to be held in different places, and it proved to be very helpful and interesting as will be seen by the following program:

10 A.M.—Out-apiaries, Charles Stewart, Johnstown.

Value of the Italian Bee, M. Stevens, Pennellville.

Sectional Hives, S. D. House, Camillus.

1:30 P.M.—Question-box.

Early Experiences as a Bee-keeper, O. L. Dines.

Wax-rendering, Mr. Stewart.

Bee Diseases, Mr. Stevens.

7:30 P.M.—Question-box.

Wintering Bees, W. D. Wright, Altamont.

Comb Honey, How to Get it, N. D. West, Middleburg.

Production and Sale of Extracted Honey, I. Kinyon.

The morning and afternoon sessions were conducted by Mr. Charles Stewart, of Johnstown. The discussions were directed in such a manner as to bring out the essential points without loss of time, making a live meeting all the way through.

The subjects were well presented, and brought out considerable discussion. Sectional hives, wintering bees, and bee diseases, seemed to arouse the most interest; and in the discussion of bee diseases especial emphasis was placed on the value of the Italian bee as the most important factor in combating black brood.

The evening session was conducted by Mr. N. D. West; and his talk on comb honey and how to get it was given in the convincing manner of the successful veteran producer.

Medina, O.

JESSE A. WARREN.

IS JAPANESE CLOVER A HONEY-PLANT?

Some time ago I saw in GLEANINGS something about sowing seed of the little Japanese clover for bee pasture. Now if it is what is called Japanese clover here, it doesn't amount to anything for bee pasture. There are hundreds of acres of a plant by that name in reach of my bees, but I rarely see a bee on it. It is an annual, makes a green carpet late in summer, and blooms in September. If it yielded nectar my bees would surely get considerable. It will take to meadows in places, but most of it grows along roadsides and on slopes outside.

Fremont, Mo.

MRS. ALMEDA ELLIS.

[Nearly all honey-plants will fail to yield honey in some localities, and yield profusely in others. For instance, the great honey-plant alfalfa, that produces hundreds and hundreds of cars of honey in the irrigated West, yields practically no honey in the Eastern States. The same is true of a large number of other plants. It is possible and even probable that Japanese clover is not a yielder of honey.—ED.]

WHITE CLOVER CAUSING BLOAT IN CATTLE.

In GLEANINGS for Feb. 15 you ask for information in regard to white clover and bloating. In reply I will say that bloating from white clover is not an uncommon occurrence. During the early summer, when growth is heavy, and when it is wet, care has to be exercised when grazing. Cattle put on such pastures about 10 or 11 o'clock, and taken off at 3 P.M., when the clover is dry, are not in so much danger. Violent exercise, or sticking with a knife to let out the gas, is the usual remedy. I believe that alsike, under the same conditions, would do likewise.

Lexington, Ky., Feb. 21.

L. E. HILLENMEYER.

OUR HOMES

By A. I. Root.

The voice of one crying in the wilderness.—JOHN 1:23.

Whose end is destruction, whose god is their belly, and whose glory is their shame.—PHILIPPIANS 3:19.

Some of you may be tempted to think me irreverent, dear friends, when I tell you I have long felt that Terry, Fletcher, Sinclair, and perhaps a few others, were in some respects like John the Baptist who kept up his "crying in the wilderness" until the sinful world not only stopped to listen but came to him from "all the region round about," asking what they must do to be saved. Of course, John's message was to a *sinful* world, while T. B. Terry's is mainly to a *suffering* world; but sin and suffering are so closely connected it may be hard to separate them.

I suppose the readers of GLEANINGS have all read the matter on the back cover of this journal for Jan. 15. If you have not, I beg of you to get it and read it at once. Of course, it is an advertisement; but after having read it over several times I decide again it contains a story of more real value to humanity than any advertisement I ever saw before in my life. It was reading this that prompted me to tell you something of what I know of T. B. Terry.

Years ago, when I first began to be really interested in high-pressure agriculture Terry was invited to speak at a farmers' institute in Medina. He gave us a potato talk, and the recital of his experiments and final successes took such a hold of me that I almost insisted he should at once put it into book form. I need hardly tell you that this book proved a boon to the farming world. A big moral comes right in here. Terry raised more potatoes, and better ones, because he made potatoes his express business in life. He seemed to recognize in the outset that, to lead the world in any thing, the enthusiast must have "elbow room." I wonder if our young bee-keepers (and some of the older ones too) are listening. To make a real success in any thing you want to be untrammelled. People laughed when Terry said he didn't want a chicken or a pig on his premises. I believe he also went so far as to say he didn't want a garden. He said he could make his money with potatoes and take this money and buy his eggs, garden truck, etc., cheaper and easier than to try to grow every thing as so many farmers do. All the stuff he wanted passed his house every day, and the neighbors were glad to supply him. Well, potatoes must have heavy fertilizing in some shape, and he soon decided clover turned under was the cheapest and best manure, and he therefore bent all his energies toward getting bigger crops of clover than anybody ever saw before. You perhaps know he has given his clover talks at various farmers' institutes all over our land. To make a proper rotation of crops, wheat came in the same way, and he soon

sold all the wheat he raised in this way, at a big price for seed because it was better and *cleaner* wheat than could be found in the market. As an illustration, he and his help once spent a whole day in hand picking over his seed wheat in order that he might keep his beautiful farm free from foul weeds. I think they got less than a teacupful of weed seed; but he considered it time well invested. He never used poison on his potatoes, because he hand-picked the mother bugs before they ever had time to lay any eggs, and the work cost him less than the Paris green.

He did make one digression in favor of strawberries. Something or somebody suggested that wonderful berries could be grown by turning under that heavy clover sod; and as an experiment, he, with the aid of his good wife and children, raised more and larger and better berries than were ever seen before in that region. Of course they brought a big price, and he saw at once there was far more money in the berries than in potatoes. Why didn't he start a strawberry farm and get rich?

Now, here is another beautiful moral. Terry's mission in this "wilderness" of sin and suffering was not in order that he might *get rich*. I, in one of my visits, talked the matter over with him. If he went into strawberries it would interfere with the education of his children, with his talks at farmers' institutes, with his being of benefit to the world at large; but he *did*, at my solicitation, write the strawberry book, that has also proved a blessing to humanity. As somebody has said of Prof. Holden, the "corn wizard," the man who put corn on the witness stand and made it "stand up and answer questions," Terry made potatoes, clover, wheat, strawberries, etc., stand up and answer questions in a way they had never done before since the world began.

Please pardon me if I refer *once more* to Booker Washington. When he got to the point where he could thank God that he was born black instead of white he said he was a happy man. I do not know that Terry has ever thanked God that he came so near the verge of the grave, but I think he might do so. Had it not happened, the world would not have had this book.

Not only did Terry make potatoes, clover, and strawberries "stand up and answer questions," but he did the same thing with his domestic animals; and his book, "The Winter Care of Horses and Cattle," was the outcome of this. The beautiful heavy farm team that carried the immense loads of potatoes to market were grown and fed on Terry's clover hay, without a particle of grain. His neighbors said it wasn't *hay*—it was just "*wilted* grass and clover." By the way, I wouldn't wonder if the world, at least a part of it, has had better clover hay since Terry's books have been published than they ever had before. Some credit, at least, is due your humble servant for having these books given the world. When Terry made such a sensation with his "clover sod" strawberries I urged him to put it in book form. He

objected, saying he was only a beginner. But I said, "Mr. Terry, you must write it *now*, when you are full of enthusiasm on the subject." He did so; and when he came to revise it, years after, he admitted I was right about it.

Well, a year or two ago I urged him to put in book form his explorations and discoveries along the line of getting out of the darkness and into the light by better ways of living, etc. For quite a time he declared he had no time, with his extensive correspondence, etc. I continued to urge, however, and I gave you notice on these pages when he started on the task. The above explains partly why I am so deeply interested in Terry's books and teachings. No matter where I travel, whether in Northern Wisconsin or Southern Florida, I come across people who tell me with enthusiasm that "Terry's teachings" have given them not only a new lease of life but a substantial addition to their pocketbooks by his simple diet and other sensible advice. With this long preface I wish now to review somewhat the book that is having such a generous welcome at the hands of the great public.

If ever there was a book written especially for our homes this is the one, and I am sure no other book has ever appeared that covers the ground this one does. The opening chapters are devoted to giving the homes of our land more and purer air than the world has ever had so far—not only pure air, but cool or cold air; and last, but not least, *moist* air. It is a little singular, but all makers of incubators are just now coming to the conclusion that this same moist air is one of the great essentials for the success of the incubator. Terry's "humidifier" for keeping the air of the average home always moist is almost a revelation to a great part of the world. Then follow some chapters on breathing and having the clothing so that the whole body has every possible chance for taking in such quantities of this pure moist air as God intended we should take. Next to the air we breathe comes the water we drink, and the reason why we should drink *lots* of pure water. I might go over the whole book in this way; but I want you all to read the book; and if you once start in you will be sure to read it all, for Terry's very plain familiar way is really enticing. Our own copy has been all around our neighborhood here in Florida. Neighbor Ten Broeck took it Saturday night and returned it Monday morning *read through*.

Now, friends, please do not get the idea that Terry is absolutely right about *every* thing. If so he would be more than human. There is, however, *so much* in the book that commends itself to *good common sense* we can afford to overlook what seems to us a mistake. I think he is a little too severe on the average family physician; but we all know good honest doctors are *all* getting on "higher ground" of late. Again, I believe that vaccination, as a rule, is a boon to humanity; the same with surgery for appendicitis, etc. If Terry's plan of living *will* obvi-

ate the necessity of all these things, then of course I shall be right with him.

In choosing my two texts I had principally in mind the sin of overeating—living to eat instead of eating to live, and I do think Terry's vehement protests against banquets, picnics, overloaded tables of rich viands, *everywhere* and *anywhere* are really "a voice crying in the wilderness" for a reform that is needed, and needed *tremendously*.

Now, I know of no more fitting windup for this Home talk than the following which I clip entire from the *Country Gentleman*. You will readily see where my two texts come in; and may God's Holy Spirit go with Terry, Fletcher, Sinclair, and *this* message to the homes of our land.

THE RAW-FOOD CULT.

[Mr. Upton Sinclair, who started the packing-house investigation with his sensational novel, "The Jungle," has now discovered that the cure for all human ills lies not only in eschewing meat, but in eating nothing but raw food. Here is his account of this practice and its results, from *Physical Culture*, which he prefaces by saying that he had been an invalid for years when he adopted it.—ED. C. G.]

I have learned that it does not matter in the least in what part of the world one is—whether in the mountains or at the seashore, in Canada or in Florida. It does not matter whether the air one breathes be hot or cold, "night air" or "day air," damp or dry—provided it be fresh, and not air that some other person has already breathed. I have learned also that it is not necessary to take very much or very elaborate exercise. I gave two years of my time to doing literally nothing but trying to get well; and during that time I made it my duty to exercise nearly all day in the open air—riding horseback, walking, swimming, playing tennis, canoeing—and I was never in worse health in my life than at the end of the two years. Now half an hour a day of real scientific exercise suffices me—with a walk now and then when I happen to have some place to visit.

And it is just the same with sleeping. Now six or seven hours suffices for every thing; and in the old days, when I was told that I needed a "rest" I would sleep ten or even twelve hours. And it is just the same with working—with brain-work, I mean. For two years I did almost nothing—I didn't dare. Now I read and write and study twelve hours a day, for as long a time as I feel like it, and it never does me the slightest harm. The "overwork" business is mostly all delusion. It is not overwork at all, but overeating. It is not lack of rest, nor lack of exercise; it is overeating. It is not a debilitating climate nor a damp and "raw" climate; it is everywhere and always some form of the fatal consequences of eating unnatural foods; of eating foods that have been cooked and devitalized; foods that have been refined and deprived of their wastes, so that they stick in the intestines and clog the system; foods that have been softened and made into mush so that they slip down without chewing, and without giving one a chance to satisfy his hunger; foods that have been concentrated and concocted and combined until all the chemists in the country would be needed to tell a man how much of them he really ought to eat.

I used to give way to the claims of "hospitality," when I went to people's homes I could not bear to make them uncomfortable and to set myself apart from everybody else; and so I was well so long as I stayed by myself, and sick whenever I went where other human beings were. Last winter, for instance, I spent several months in a solitary place in California, working hard and enjoying magnificent health; and then I went up to San Francisco to stage a play, and I accepted some invitations to lecture at the universities; and the boys got me up delightful suppers of fruit salads and peanut-butter sandwiches and ice-cream and cake, and other wholesome and nutritious vegetarian concoctions. So in a few weeks I was having headaches again, and then a cold, and finally wound up on the Gulf of Mexico with a "sunstroke."

In youth I had the misfortune to be fed on many delicious-tasting inventions. I lived in the South, where people are very proud of their cooking. I have said that I was brought up on a diet of fried chicken and hot biscuits and chocolate cake, and so in our home we had to have a servant. When we were in the coun-

try we had to have two, because one found it too lonely. I have no more vivid memories in my life than of these "servants"—strange and perplexing personages who came from the south of Ireland and the north of Sweden and the middle of Hungary and Japan. The Hungarian ate raw sausage and bacon; the Irish one dropped dead of apoplexy, and one from South Carolina went crazy and threw the salt-box at my mother's head.

There were times in our struggling days—many years, in fact, when we could not afford a servant, and then my wife had to be it. And when she was ill, which was about half the time, the role fell to me. So I know just what I am talking about when I discuss this question of cooking, and what it means to human beings. I have known what it is to build the fire and broil the beefsteak and fry the bacon and eggs, and peel the potatoes and shell the peas and boil the coffee and make the toast; and to sit down and stuff it all in quick before it got cold and spoiled, and then to crumb the table and put the things in the ice-box and sweep the floor and wash and dry the dishes and fill the kettle and carry out the ashes and bring in more wood; and then hitch up the horse and drive to town to get more stuff from the butcher and the baker and the grocer and the druggist, and then hurry back home because it was time for the next meal. For a long time it was worse even than that, for we had a sick baby, and the doctor had laid out an elaborate schedule for him, which included such trifles as broiled chopped meat and chicken broth and gruel and cream six or eight times a day. We have gone through with this sort of thing for weeks and months and even years; and now, as I look back upon it, it seems to me a miracle that we ever missed committing suicide, as we so often thought of doing.

And now will you stop and reflect that there are five million farms in this country, and an even larger number of workmen's homes; and that in every one of them there is some wretched slave, shut up to toil in just such a treadmill, without hope of respite for life—the men spending all of their energies in earning food and the women in cooking it; and all for no purpose, save to supply occupation for an army of doctors and another army of dentists and another army of druggists and another army of those who manufacture and advertise and sell and transport patent medicines? I have an account of the drug industry of the city of Detroit, in which it is set forth that in that city alone there are manufactured nine billion pills a year. And now bring yourself to realize that every single one of those pills represents a meal which somebody ought not to have eaten—the appalling total of a hundred meals a year for each man, woman, and infant in the country!

I have come out from all that as from a charnel-house into the bright sunlight and fresh air. I am spending the winter in the South with my little boy. We have a big house, but we should no more know what to do with a servant than we should know what to do with a white rhinoceros if President Roosevelt should send us one from East Africa. We have a barrel of walnuts in the pantry, and one of pecans; a sack of figs and one of prunes and one of raisins; and once a week the grocer-boy brings a big bunch of bananas and a box of oranges and a basket of persimmons, and there we are. Three times every day we put some of these things into a bowl and pump water over them till they are fresh and shiny, and then carry them out on to the lawn; and there we spread a newspaper into which we throw the nut-shells and the banana-peelings; and when we are all through we chuck the paper into the stove and put the bowls back in the kitchen, and our housework is all done. We have no fires and no dirt, no smells and no grease, no soiled dishes and no ice-box, and no garbage-can and no medicine-chest.

HAS MONEY FOR MISSIONS, ANYHOW.

I have been the recipient of GLEANINGS for many years, and a constant reader of the Home papers and Notes of Travel. I have been for seventeen years a Methodist minister in the mission fields of South Dakota, with an average salary of \$300, and no missionary money. I have always labored to make the people ambitious to carry their own work and also contribute of their own means to the mission fund. My prairie circuit last year, consisting of twenty-six members, furnished \$40.00 for missions. I feel called on to make this report, for I esteem A. I. Root one of my very best friends.

Bijou Hills, S. D., Dec. 31.

R. N. KRATZ.

POULTRY DEPARTMENT

By A. I. ROOT.

UTILITY AND BEAUTY; CAN THEY BE COMBINED?

Mr. Root:—In your poultry department for Dec. 15 the heading reads: "Is it eggs and meat we want, or is it fancy feathers and a good-looking chicken?" This implies that a combination of both qualities is impossible; further, the article advocates Leghorns or Leghorn crosses for eggs and meat; if so, why Leghorns? Surely you would omit the meat clause. A Leghorn broiler is possibly a fairly good meat proposition; but beyond the broiler stage it is well to leave them out.

It is also assumed that "Leghorn" expresses egg type. Why? It is hard to find absolute authority to substantiate such claim; but at the same time it is generally acknowledged that the Leghorn is entitled to that distinction—not that it lays more eggs, but that it produces them more economically, and, as a pullet, becomes a producer ahead of other types.

It is very hard for me to believe that fine feathers and excellent type would lessen egg production or carcass value; and I thoroughly believe that the best layers in the land will be found where the stock grades the highest. Certainly some fancy drones exist in every fancy flock; but surely some drones continue their useless lives in common flocks.

Is it not a fact that the most authentic reports of actual performance can be obtained only from fanciers and specialists? Is it not true that the fancier has the best of reasons for keeping track of individual performance? and does not the fancier set a higher value on performance when the eggs produced have a highly enhanced value than does the commercial poultier who sells eggs by the dozen?

It would interest many of your readers could they assemble as one of a bunch of real cranks—I mean the kind that dilates on barring, penciling, under-color, etc., and then hear the trap-nest talk. You would soon learn that the laying quality was considered very important, and some of the records made for certain periods would make Ananias jealous of his laurels; but the fancier does not put egg production first; but at the same time that very important function is rated high, and an outstanding specimen from the fancy standpoint that is also a heavy layer is valued far beyond the reach of ordinary buyers. In fact, it is only the fancier who will pay a fancy price for a fancy performance.

I heard two fanciers offer \$2.00 apiece for every egg that one certain Barred Rock pullet would lay during the coming months of March and April. This was at the late Chicago show, and the offer was refused point blank, if that pullet turns out to be as good a layer as other Barred Rocks that I have owned; her owner turned down an offer of at least \$100 for her produce for two months. Suppose she had been a hen with an authentic record of 250 eggs for the preceding year, but she herself lacking in high-class breeding characteristics, do you think there would have been several buyers willing to take all her eggs at \$2.00 apiece? I don't. I know all the parties pertaining to the foregoing paragraph, or would not have mentioned the circumstance.

I have no wish to belittle the value of laying quality, but I here assert as my honest belief that fine feathers do not lessen the laying function, and that ordinary flocks are benefited by using high-class males; for it goes without argument that in the course of a few years the heaviest layers in a flock will have the greatest number of descendants.

Many flocks have been ruined by crossing; and advocating this method is dangerous for usually those who try it are the least capable of controlling it; and a fairly good flock may degenerate into dunghills very promptly.

All the American breeds and varieties combine utility with fine feathers, and some other classes do likewise; but Leghorn crosses are not likely to add any valuable feature to any of the popular breeds.

Sioux City, Iowa, Dec. 27. MATT. W. BALDWIN.

Thanks, friend B., for the facts you present, and for your protest against haphazard crossing. I afterward thought better of my resolve on the spur of the moment, and my Leghorns have not been crossed. In a re-

cent talk with Chas. McClave, of New London, O., he informed me that all the great layers of recent date have come from high-scoring strains of fowls. The perusal of Kellerstraus' new book has given me faith in the results of years of careful work in perfecting a strain.

WHY MR. ROOT LOST HIS LITTLE CHICKS.

In GLEANINGS for Feb 1st Mr. Root gave his experience with rats and other animals killing his chicks, which was really as sad to me as it was for him.

I have found it best, when buying an article of any kind that was new to me, and I did not know a l about the thing, to read the instructions thoroughly and follow them. Mr. Root, having bought a lamplless brooder, did not put his 60 or 70 chicks into it for two weeks after hatching, which was most decidedly wrong. In this case he thinks a basket and a cheap burlap covering is better, thereby showing to me that he did not have any faith in a lamplless brooder until the chicks were partly grown. And when he did change the chicks from the basket to the brooder it had to be a *forced* change, because it is not a chick's nature to change its location or roosting-place.

Now, if Mr. Root had taken "my word for it," and placed his chicks direct from the incubator to the brooder, and placed the brooder out in his yard, and closed the doors up tight for twelve to eighteen hours out of every twenty-four for at least three days, he would undoubtedly have had all his chicks now. The brooder is animal-proof when the doors are shut unless they gnaw through the material. Having placed the brooder in the yard, the "prowler" would have given Mr. Root warning of its presence long before the ten days were up, at the end of which time I recommended leaving the small door open for more air, and in the meantime the chicks would have learned that the brooder was their protection from storms; and when it rained it would have been Mr. Root's pleasure to see the chicks "put" for the brooder instead of trying to catch them under such difficulties.

The best way to catch chicks is with a broom. Take it in the right hand about half way down the handle, and circle it around over a chick, just heavy enough to stop its running, and then pick the chick up with the other hand. With a little practice Mr. Root will be able to pick up one hundred chicks in five minutes.

My advice to Mr. Root is to "try again;" follow the instructions, and be happy next time. I have learned to raise chickens "just nature's way"—Mr. Root may call it God's way. I am trying to impart my knowledge to others through my instructions; and when followed it will lead to a most satisfactory success.

Chicks are prey to cats, hawks, and a large number of animals. A great many animals will go through and under a fence—the cats and hawks, over it. A good watch-dog for night and a shotgun for daytime are about the best protection for a chicken-yard.

Aurora, Ill., Feb. 10.

V. W. CLOUGH.

But, my good friend, how about that incomplete "dooryard"? Surely \$2.50 is enough to pay for a dooryard 2½ feet square and 6 in. high (*thin lumber*), finished complete. Because this is a warm climate, I sent for the dooryard so the chicks could have good ventilation on hot nights; and when I saw it was netting only overhead I was, as I have said, a little fearful. I did read "directions" carefully, and the chicks had been in the brooder a week or more, and knew where to go. After I put on the netting *that you omitted*, the "night prowlers" tunneled clear under it and under the brooder, going under ground on one side and out the other in their frantic efforts to get the chicks. Thanks for your plan of catching chickens with a broom. I wonder if some woman didn't suggest the idea. A dog and a shotgun are probably all right; but while poultry netting, even small mesh, is so cheap, why not have your fowls, big

and little, where they can be locked up nights and still have such ample ventilation as T. B. Terry is writing about? It is worth something to me to know, when I go to sleep nights, that all my fowls, big and little, are *absolutely safe*. I know it is some trouble to go around and shut all the doors after they are "gone to roost," and then get up at "peep of dawn" and let them all out; but after a faithful trial I feel sure it is worth all it costs to make these frequent visits in getting acquainted with the chickens so you can be on familiar terms with them, aside from the security from prowlers.

DO HENS LAY IN THE SUMMER TIME IN FLORIDA?

When I was on the island I was told by the people there they seldom got eggs of any account in summer; and when I reached there in the middle of November, they said the hens had just started to lay. I have alluded to this matter before; and as a proof that that they do lay every month in the year, if properly cared for, I give below a report from my neighbor who took my fowls while I was in Ohio during the summer.

EGGS FROM A. I. ROOT'S HENS DURING THE SUMMER.

April, 1166; May, 834; June, 741; July, 683; August, 767; September, 578; October, 420. Average number of hens, about 65; average number of eggs per day, 24.

You will notice October was much the lowest on account of moulting; and, if you recall, when I arrived here in November I got very few eggs for some little time. Many of the above 65 are two years old, and a few *three* years.

FIRELESS BROODERS.

It is refreshing to note that so good an authority as *Poultry Record* has arrived at exactly the same conclusion I have already expressed in regard to fireless brooders and a brooder-house for the fireless brooder. Read the following:

For a hover for a fireless brooder I prefer a loose sagging blanket to slitted rags, as the chicks are apt to become tangled up in the rags or ravelings from them. With a sagging blanket there is no danger of this. Any one can make a fireless brooder. There are a great many patterns and some complicated affairs; but so far as I know they are no better than the simple patterns. I make mine out of cracker-boxes; pad the sides and have a warm sagging blanket attached to a frame that rests on cleats on the inside of the box. I have a pad or pillow stuffed with hay, feathers, or cotton which I lay over the frame holding the hover blanket to conserve the heat when the weather is cold. I have intake holes for fresh air near the bottom, and outlets above the blanket. It is a very simple affair, and can be made in a short time at a cost for material of from 25 to 50 cts. The brooders are so inexpensive that there is no necessity for crowding the chicks.

The expensive part of operating a fireless brooder is the coop in which it is placed. A brooder-house or colony-houses are necessary. The small low-down coops which we see recommended are not practical, in my opinion. I once used some of these coops, and every time I opened them the chicks would fly out; or when it was necessary to close them during a storm the chicks were in darkness. I then came to the conclusion that, to raise chicks with any kind of brooder, it is necessary to have it under shelter where the attendant can get in among the chicks.